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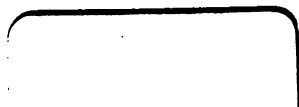
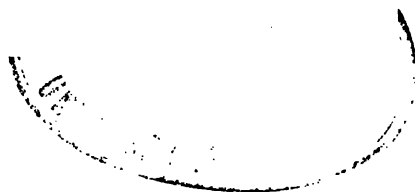
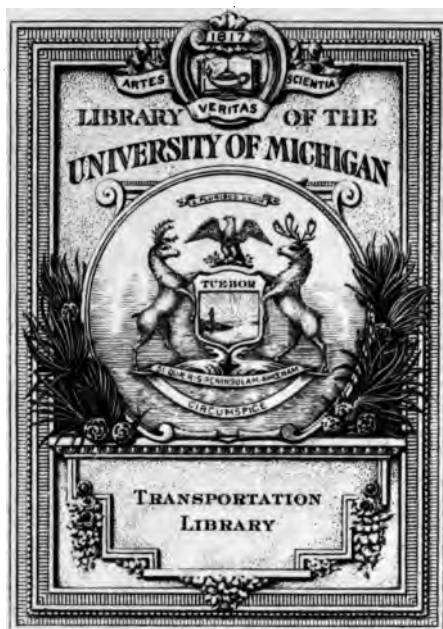
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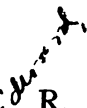
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BY

E. R. McDERMOTT

JOINT EDITOR OF THE "RAILWAY NEWS"
AND CITY EDITOR OF THE "DAILY NEWS"

METHUEN & CO.
36 ESSEX STREET W.C.
LONDON
1904



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RAILWAYS



RAILWAYS

CHAPTER I

HISTORICAL SKETCH

TRANSPORT of person and property is one of the fundamental needs of Society, and the applications of steam power to this service by land and sea form noteworthy steps in human progress. No other forms of enterprise have contributed more to the comfort and well-being of the community, and few have yielded safer and more satisfactory returns on the outlay involved. New or modified methods of locomotion are now being rapidly developed, and it is opportune to consider the advance so far made, and its probable future direction.

The evolution of the roadway naturally preceded that of the motive power. From the earliest times records exist of the provision of artificial surfaces, generally of wood or stone, to reduce friction in haulage. The increased facility in the production of metals during the eighteenth century led to the employment of iron rails for this purpose in several collieries and

quarries. Simultaneous experiments were in progress for the construction of steam motors, and in the first year of the last century a locomotive constructed by Richard Trevithick was running on the public highway in Cornwall. Another of the early types of engine was tried on the Merthyr tramway; but considerable difficulty was found in securing sufficient boiler pressure, and the device of turning the waste steam into the fire-box to increase the draught made the initial success in 1813 of the venerable "Puffing Billy," which, after more than half a century of continuous work in the Cleveland district, is now passing a meritorious old age among the national treasures and curiosities at South Kensington. Its companion in retirement, the better known "Rocket" of George Stephenson, the winner in the competition at Rainhill, near Liverpool, in 1829, added to previous and successive improvements the tubular boiler, and though continuous development has since taken place, the 100-ton monsters in occasional use to-day differ only in detail and not in principle from the roughly made machine of $4\frac{1}{2}$ tons, which early in the last century hauled a coach at thirty miles an hour, to the wonder of the assembled representatives of commerce and science. It speaks well for the ability and conscientious work of the pioneers of railway construction, that until recently it was a common experience on all the leading lines to have engines in daily use whose periods of service ranged from a quarter up to half a century.

The diversity of forms which existed in the early

years of railways has tended more and more to disappear, as most of the leading companies in this country now manufacture their own rolling stock, and there is a manifest advantage in having interchangeable parts. Inside cylinders are generally in use on the through lines of the United Kingdom, it being contended that by this means weight is better concentrated and oscillation is minimised, while there is less chance of injury to the moving mechanism. There is certainly some objection involved in the complication of the driving axles, and the comparative inaccessibility of the valves and cylinders for purposes of repair. Outside cylinders are practically universal on American lines. The bogie truck is now in general use for the leading wheels on both sides of the Atlantic. Single driving wheels were formerly employed by some companies, but are now mostly superseded in consequence of the growing demand for increased hauling power, and coupled wheels are generally used in the passenger service. For goods trains the six-coupled engine is mostly employed.

In this country the boiler is carried on a stiff plate-frame, while the comparatively cheaper form in use in the United States has the mechanism attached direct to the boiler by a bar-frame, which is thought here to throw too much strain on that structure. In the attempt to get more boiler power in English engines, use has been made in a few cases of water-tubes, but the difficulty in preventing leakage has prevented their wide adoption. The use of "compound" engines has also not made much progress, though a saving of from

10 to 15 per cent. in fuel is claimed by their adherents. The complication of parts is one of the chief objections to the system. Some of the companies have made experiments in the use of oil fuel, and a reduction of working cost and of wear and tear seemed to be promised. Extensive adoption of the system either for locomotives or steam vessels would, however, probably be followed by such an advance in the prime cost of the crude material best fitted for burning that the use of the fuel is checked.

It would certainly seem that the evolution of the steam locomotive has reached a point at which much further progress can hardly be looked for, especially having regard to the limitations as to height and weight imposed by the existing headway and other dimensions of the road-beds in the United Kingdom. In view of the constant demand for heavier and more powerful machines, there is some ground for regret that the final issue of the "battle of gauges" was the extinction of the 7-foot width of rails adopted by the Great Western Railway, which finally disappeared in 1892, leaving all the English and Scottish lines of the standard width of 4 feet 8½ inches, the arbitrary space between ordinary cart-wheels on the inception of railways. This gauge is now of wide distribution. In Ireland 5 feet 2 inches was adopted and maintained, and in India 5 feet 6 inches is the standard; while in all parts of the world narrow-gauge lines, ranging from two feet to a metre and upwards, are to be found.

With regard to other rolling stock, the tendency since

the opening of the first line of railway has been towards the gradual improvement of the accommodation offered to passengers, every addition to the facilities and comforts offered being followed by a notable increase of patronage. Three classes of carriage have always existed on the majority of the railways in this country, but the great capacity for development of third-class travel was not at first recognised. Credit must be given to the Midland Railway for some portion of the progress made in catering for the wants of the majority. Following on the extension of their line to a London terminus, the directors in 1872 adopted the policy of attaching third-class carriages to all the trains, express as well as ordinary. A number of Pullman cars were about the same time imported from the United States, and this making in effect four classes of vehicles, it was resolved in 1875 to discontinue the use of second-class travel. The example thus set has not been generally followed, but the North British Railway, forming the Midland connection in Scotland, after a considerable interval abolished that class, and the other Scottish lines subsequently did the same. The North Eastern and Great Central and the Great Northern for through travel run no second-class carriages but most other companies profess themselves satisfied with the revenues derived from an intermediate class, especially where the fares have been lowered so as to induce even thrifty passengers to pay a slight increase over the third-class fare in order to secure somewhat more select fellow-travellers. Meantime the fittings and conveniences of

all classes have been improved; dining and lavatory accommodation is supplied on most long-distance trains; the corridor system being in some respects an improvement on the Pullman and Wagner coaches in use on the other side of the Atlantic, while less cumbersome and expensive to haul.] It must be remembered, however, in making comparison with foreign rolling stock, that most of the travel in this country is necessarily for short distances, and for the service required no comparison need be feared by most of the British companies. The ordinary fares in the United States cover only one class, but extra charges are made by the outside organisations which provide the superior accommodation, the railway companies only doing the haulage. Inferior vehicles for immigrants and negroes form in effect a third class on the other side of the Atlantic.

The first railways were laid out with the idea of the rolling stock being supplied by travellers and freighters, and the ownership of a considerable number of goods and mineral waggons is still vested in the customers of the railways, a fact which constitutes an obstacle to some desired reforms in the conduct of freight traffic.

Q. With reference to the construction of the road-bed, the work in this country, carried out under strict Government supervision, is doubtless of a solidity and permanence hardly equalled elsewhere in the world. The careful fencing of the property, the provision of over and under bridges, and the extent of station and

terminal accommodation in crowded cities, justifies to a large extent the excessive cost as compared with most foreign systems. There has been considerable change in the form of the "permanent way" since the laying of the first railways, the size of the rails necessarily growing with the increased weight of the rolling stock and freightage. On the original Stockton and Darlington line the wrought-iron rails weighed 28 lbs. to the yard. The cheapening of steel by the use of the Bessemer process has caused its universal adoption for rails, and the usual weight now ranges from 80 lbs. to as much as 100 lbs. to the yard. In British railway practice the rails are fastened to wrought-iron chairs, held by wooden wedges, and the chairs are spiked on to transverse wooden sleepers. In the case of American and colonial railways, where timber was originally cheaper, the sleepers or "ties" were, and are still, laid down at closer intervals, and the rails are spiked directly on to them without the intervention of chairs. The joints are made by "fish plates," bolted on each side of the rails, the expansion and contraction of which, under the influence of the weather, is allowed for by means of oblong or elliptical bolt-holes. Wooden sleepers on gravel ballast are found to give the requisite elasticity, and are now of almost universal use, though cast iron has been sometimes employed to obviate the ravages of insects in tropical countries.

The construction and ownership of railways in this country, though closely supervised by Government regulations, has always been left to private enterprise,

and as this was the birthplace of steam locomotion, large initial cost was incurred, which has been avoided or reduced by communities profiting by our experience. To overcome national and local prejudice heavy outlays were involved, land and other properties had to be acquired on exorbitant terms, and the various systems were laid out without any fixed plan for providing for the needs of traffic. That the public on the whole has been so well served, and that the results to investors have been generally so satisfactory is, under the circumstances, a matter for congratulation. The work was certainly more rapidly, if not more systematically, carried out than if initiation and construction had been left to any public body. The Act of Parliament for the construction of the Stockton and Darlington Railway, the first line used for passenger traffic, was passed in 1821, and the railway was opened on September 27th, 1825. It is on record that the first train arrived at Darlington, a distance of $8\frac{3}{4}$ miles, in 65 minutes.

The subsequent improvement of the locomotive already referred to gave a great impetus to railway promotion and construction. The Liverpool and Manchester Railway, upon which the "Rocket" made its début, was opened for traffic in 1830, and in 1838 the route between London and Birmingham was completed. Railway promotion followed thick and fast, culminating in the "Railway Mania" of 1845 and the accompanying financial collapse. In that year there were lodged no fewer than 1263 Bills, representing a capital of 563 millions sterling, and involving, under

the then existing regulation, a deposit of actual cash amounting to 59 millions.

The publication of these figures created alarm. A panic ensued, and the stocks of existing railways were greatly depreciated for a time, while the premiums quoted on embryo projects disappeared. Of the total projects of that notable year only 120 survived the ordeal of Parliament, which, however, in itself represented a good session's work. Out of the chaos then ruling order was gradually evolved, and the main systems of the country assumed the positions since occupied with comparatively little recent modification.

Parliament has in effect sanctioned the business-like and equitable system of allocating certain districts or lines of route to each separate corporation, and has been indisposed to sanction harmful or unnecessary competition. Each company has had to satisfy competent authorities both of the public need for the railway proposed and of the probability of its earning adequate dividends and interest on the capital involved. Recent practice has also included demands for proof of the financial capacity of the promoters.

Subject to these reasonable requirements, there has been practically Free Trade in railways in this country, though the price paid in parliamentary costs for the Government supervision has doubtless been exorbitantly high. It may fairly be said that the two countries in which railway development has been most rapid and most beneficial—Great Britain and the United States—were those in which Government initiation and regulation have been least in evidence.

The principle of State ownership of railways is, however, not wanting in adherents in all parts of the world, and in many of our own colonies and dependencies it has been widely adopted. In a new community, wanting in accumulated local resources, there is an obvious advantage in pledging the collective credit to raise capital for the provision of acknowledged requirements, and there is something to be said in favour of retaining in the hands of public authorities the administration of works of public necessity and securing the profits for the public advantage.

The danger of placing the control of so important a service in the hands of a monopoly would appear to be a cogent argument against private ownership, but in practice fears of excessive rates and inadequate accommodation as accompaniments of corporate enterprise are found to be unjustified. The elements of competition and the incitements of individual or corporate gain have been usually found sufficient to provide all requisite facilities for the public convenience and comfort. On the other hand, Government management has invariably been lacking in initiative, whether in providing the railway accommodation or working it to the best advantage, while political or party considerations are often found to override the main question involved, viz. the provision of the fullest facilities for travel and transport consistent with the earning of an adequate profit on the capital invested.

The enormous increase of patronage involved in the working of railways as a State Department, there being

in this country over half a million railway employees, is an evil not readily to be guarded against. The success attending the operations of such departments as the Post Office is often instanced as proving the possibility of efficient administration of railways by the State; but the postal service is a simple matter compared with the establishment and working of a large trunk railway, in which constant change and progress is required to meet growing public requirements, while Government management is notoriously afflicted by "red tape" and bound by precedents.

The first railway in France was opened within three years of the construction of the pioneer British line, and British capital and methods were at first extensively employed. Subsequently, in 1842, attempts were successfully made to systematise the provision of railway accommodation. The country was partitioned out amongst six great companies, and it was arranged that the cost of construction should be borne in part by the general Government, in part by the districts through which the roads passed, and in part by the companies operating them. Changes of Government and financial difficulties have modified these arrangements from time to time; but the effect has been that the State at the present moment owns about one-third of the capital, and towards the middle of the present century will become the absolute proprietors of the various French systems.

Railway construction in Germany was commenced some ten years later than in this country, and about

ninety per cent. of the mileage is now owned by the Government. The lines were well and cheaply constructed, and form a valuable national asset, but political and military considerations bulk largely in their operation, and the convenience of the public is fixed on a lower standard than that to which we are accustomed.

Of the Austrian railways a portion is owned by the Government, and the concessions for the remainder expire within limited periods.

The Hungarian railways are owned entirely by the State, and a striking feature in their operation has been the introduction of the Zone system of passenger fares, under which each station, taken as a point of departure, is considered as the centre of certain zones, which increase in a regular ratio. Passenger rates are fixed not per mile, but at so much per zone. The result of the system is to encourage long-distance travel, the effect being a constantly diminishing rate per mile in proportion to the distance traversed. The system has been extended to goods transport, but the experience of a dozen years' working has not been such as to lead to its adoption elsewhere.

Italy has tried numerous experiments in private and State ownership of railways, the changes arising out of political and financial exigencies. In 1885 the three chief systems were taken over by private companies from the Government under lease, the companies purchasing the rolling stock and equipment from the State in consideration of annual subventions.

Spanish and Portuguese railways are owned and operated by private companies, while the lines in Belgium are mainly the property of the State.

In Russia the Government owns and operates about one-half of the railways, and the private companies concerned have in most cases received aid from the State by way of subsidy and guarantee. The vast Trans-Siberian line, it is needless to say, is entirely a Government undertaking.

The minor States of Europe mostly favour the principle of State ownership of railways, either present or prospective, on the termination of concessions.

The exceptional circumstances of railway operations in India have doubtless rendered the principle of State ownership and control more especially applicable. Military and political considerations have had much to do with the planning, construction, and operations of the various lines ; but it is safe to say that the systems would not have attained their present dimensions and importance if dependent on Government initiation. Private companies were formed with a State guarantee of interest and options to the Government to purchase which are being from time to time exercised. To the older companies the guarantee of interest was given for ninety-nine years, the guarantee being only liable to deduction in case the gross receipts fell short of the working expenses. It was provided that if the net receipts of any company exceeded the amount due to it for guaranteed interest in any half-year, one-half of the surplus should be paid to the company and the other

half to the Government, in repayment of advances of interest previously made, and if such advances and interest should have been entirely repaid, the company would be entitled to the whole of the surplus profits.

Under the powers of purchase the Government, within six months after the expiration of the twenty-fifth or fiftieth year from the date of contract, could give notice of its intention to purchase a line and either pay a sum equivalent to the value of all the share capital, calculated on the mean market value of the preceding three years, or pay an equivalent annuity for the residue of the term of ninety-nine years. Under these agreements the East Indian line was taken over in 1879, the Eastern Bengal in 1884, the Scinde, Punjaub, and Delhi in 1885, the Oude and Rohilkund in 1888, the South Indian in 1890, and the Great Indian Peninsula in 1900. Annuities were issued for the purchase of all these properties except for the Oude and South Indian systems, which were acquired by a cash payment. The powers to purchase the Bombay and Baroda and Madras lines mature in 1905 and 1907 respectively.

Various arrangements have been made for the provision of sinking funds with the several annuities, which need not be here specified. Taken on the whole, despite the drawback connected with the depreciation of the silver rupee and the loss in providing for the payment of interest charges in sterling, the Indian railways have proved very satisfactory investments both for the Government, the shareholders, and the public served. The inherent disadvantages of State control must, how-

ever, be recognised, and on this point the report of Mr. Thomas Robertson, the special commissioner appointed by Lord Curzon to inquire into the working and administration of Indian railways, is worth careful attention. The report is a valuable work of reference on railway problems generally, whether or not it leads to that "root and branch" reform of the Indian railway system which is recommended.

It shows that at the close of the year 1902 there were 25,936 miles of railway open for traffic in India, of which 17,754 miles were operated by companies, 2,184 by Native States, and 5,998 by the Indian Government, making a total of thirty-three separate railway administrations. Broadly speaking, however, the lines may be divided into two main groups—viz. those for which the Government has full financial responsibility (20,474 miles), and those which are financed by companies or Native States without assistance from the Government other than free land (5,462 miles). Over the latter class the control of the Government is little greater than over the railways of the United Kingdom; but the former, which constitute more than three-fifths of the whole, are worked either as State railways or by companies under contract. The State lines are each worked through a manager, to whom the Government gives extensive powers and pays a fixed salary, which in no way depends upon results. The State authorities, however, consider it sufficient to exercise only a general control over him through their directors of railway traffic and construction, and they leave him, within the powers

assigned to him, to manage the railway in the best interests of the public and the country. The contract lines, on the other hand, are each worked through a company in London, which is paid by results. The company from amongst its members appoints a board of directors to administer its affairs, and the board appoints an agent to represent the company in India and work the line. But, as Mr. Robertson points out, while the Government give one of their agents—namely, the manager—extensive powers, and exercise only a general control over him, they allow the other agent—namely, the board of directors—no power whatever, and exercise the most minute control over its operations.

After giving the fullest consideration to all the circumstances, Mr. Robertson has arrived at the conclusion that it should not be necessary to exercise a greater degree of control over the company-worked lines than is now exercised over the State-worked railways; and that, while it is essential that the Government should retain full power of control, the exercise of that power in the form which it now takes is both wasteful and harmful. The only logical alternative, in his opinion, is to do away altogether with the contracting companies, and to work the whole system, for which the Government has financial responsibility, as State railways. Mr. Robertson is clear that the two systems should not both be in operation. In his opinion, the Government should either work all the railways as State railways or lease them all to companies to work. The latter, he thinks, would on the whole be the better course.

He proposes the creation of a small board, composed of specially qualified railway men, who should be left entirely free to administer the railways, subject to the control of the Governor-General in Council. He would place his Indian railway board under the presidency of a chief commissioner, who should have a thoroughly practical commercial knowledge of railway working, assisted by two other commissioners, who should be men of high railway standing, and should have a similar training to that of the president. This is the system which obtains in several Australian colonies, with this difference, that the Indian board would, under Mr. Robertson's scheme, leave the details of administration and working to the managers of the various lines, and would confine their control to the broader principles of railway management. In fact, his complete scheme is that all the lines controlled by the Government should be leased to working companies, the directors and officers of which should be supervised by the proposed new railway board. The board would further be the tribunal for deciding as to the construction of new lines. With reference to further development, he proposes the creation of a railway fund, similar to that provided for by the Light Railways Acts in Ireland, to be applied in providing improvements on State railways, and towards the construction of new lines. "In Ireland," he says, "the Light Railway Act proved of the greatest benefit to the country, and I feel confident that if a similar arrangement could be introduced in India, and the railway board given a free hand within

such conditions as Government may consider necessary to lay down, a great impetus would be given to railway construction in India, and the Government would rarely be required to provide any more capital than the original contribution. On the contrary, I am satisfied that the railway board, as soon as they got into full working order, would always have a handsome balance to hand over to the country at the close of the year."

In the matter of working, Mr. Robertson's recommendations are summarised as "cheaper fares, more comfortable, expeditious, and safer travelling, better train service, speedier transit for goods traffic, and lower rates for its conveyance." He also recommends the adoption of the 4 feet 8½ inches gauge as the standard for India in place of the mixed 5 feet 6 inches and metre gauges now existent. The introduction of such a change, sweeping as it sounds, would, in his opinion, be quite practicable, if it were slowly worked up and prepared.

The construction of railways in the Australian colonies as private enterprises was not a success, and finally the separate Colonial Governments undertook the work. The operation of the lines, when opened, was not at first satisfactory, either from a financial or a public point of view, and commissioners were appointed to formulate regulations for the management of the properties. Difficulty has arisen from the fact of the competing, and at times conflicting, interests and policies of the different Governments, and neither in the planning of the various systems, nor in their united

operations, have the best results been obtained. The special evils of State ownership have been made apparent from time to time, and labour troubles have been acute. The railway wage-earners, being voters, have means of exercising pressure on the administration to the disadvantage of the public service. It may be hoped that the federation of the five different colonies may remove some of the difficulties hitherto attending railway operations in Australia, which are instanced by the fact that no less than four different gauges exist on the continent, viz. 5 feet 3 inches, 4 feet 8½ inches, 3 feet 6 inches, and 2 feet 6 inches. Most of the private lines, which aggregate rather over 1,000 miles in length, are owned by mining and other companies, and are used chiefly in connection with their own industries. Some of the tramway services in New South Wales and West Australia are owned and operated by the Government.

Railways in South Africa are also owned and operated by the State. The lines which form the main routes have given good results, both for the finances and the general development of the colony. The taking over of the Transvaal and the Orange State opens a new era for railway development in the country, and some much-needed links in the chain of communication will doubtless at once be provided. With the increased business which may be looked for, it is doubtless to be regretted that the existing lines are on the exceptionally narrow gauge of 3 feet 6 inches, which, though suitable for pioneer projects, restricts considerably the accommo-

dation possible for passengers and goods, and would render the Cape-to-Cairo route, if and when completed, less attractive to tourists of the more luxurious class.

The railways of Egypt form a State department. Suggestions have been made from time to time to hand over the administration to a private company, from which, doubtless, better financial results might be obtained, as the lines would be run on more strictly commercial principles. As Lord Cromer, however, has recently pointed out, in order that the private-enterprise system should work efficiently, so far as the general public is concerned, there should be at all events a possibility of competition, and practically there is no possibility of other railways competing with those which already exist in Egypt. The only possible competition is the river and canal traffic. But the present system of so-called public ownership is really a divided one, and it has the disadvantage, as Lord Cromer himself admits, of making the raising of capital difficult. This can only be owing to international jealousies. If the railways were in private hands, the money could be raised easily enough, with every prospect of added railway mileage and added prosperity. The extension to Khartoum, first laid out for military purposes, and the construction of light agricultural lines, point to further development of the Egyptian system.

Canada and the United States both afford instances of the advantages and drawbacks of practically unlimited freedom in railway enterprise. The Grand Trunk Railway, launched under very influential London

auspices, laboured under the disadvantage of extravagant methods of construction, and during the slow development of the line in a sparsely populated country a wasteful system of paying unearned interest in paper capital was adopted, from the evil effects of which the line is still suffering. The growth of the Dominion in recent years has brought a considerable measure of prosperity, both to this line and to the Canadian Pacific Railway, an undertaking formed with liberal Government assistance by way of land grants.

The rapid settlement of the North Western Territories, in view of the fertility of its wheat belt, and the development of the mineral resources of British Columbia have so far established the resources and credit of the Company that it has become one of the most powerful corporations in the world, with a transcontinental route and fleets on both the Atlantic and Pacific Oceans.

The Canadian Government lines in the eastern provinces have been rather political undertakings than commercial ventures, and have hitherto been unprofitable as investments; but there would seem to be ample prospects for the successful working of a second, or even a third, transcontinental line in Canadian territory.

Railroad enterprise in the United States has had a very chequered history, and the experience of British investors in this field has been by no means uniformly satisfactory. State and Federal legislation have alike been favourable, and even indulgent, towards the construction of railways. The locomotive has been the pioneer in opening up new territories, and the iron way

has frequently preceded ordinary roads. The average cost of construction has thus been exceptionally low, and the success which has attended the operations of many of the lines may be readily explained by the fact that towns have grown up on the lines of communication. Population and industry have followed instead of preceding them, as in the case of older settled countries. By far the largest development of railway construction in proportion to population has taken place on the other side of the Atlantic, and the working of railways in all parts of the world owes much to the inventive genius of Americans.

The rate of progress has not, however, been without its corresponding drawbacks. Construction has not been hampered by undue legislative restriction; but, on the other hand, the interests and safety of the public have often been jeopardised by want of adequate supervision of details. The initial work has frequently been such as to necessitate practical reconstruction, as traffic has grown. Traversing, for instance, the streets of a town and the permission of level crossings do not make for the safety either of passengers or of the general public. The general use at one time of timber trestle work to avoid the construction of solid embankments is another instance in which work has been left for a succeeding generation of shareholders to provide for.

Financial methods were in many cases equally defective. No limit is placed in many States to the piling up of bonded debt on railways, which in some notorious cases were built entirely by borrowed money, while the

share capital was practically given away. The mortgage powers granted over American railroad properties led to an immense proportion of bankruptcies, and during the last quarter of a century no less than six hundred separate companies, representing 110,000 miles of line, and with capital aggregating \$6,500,000,000, have passed through the ordeal of receivership and reorganisation. It is somewhat difficult, in the face of these facts, and of the enormous losses suffered in the past by British investors in American railroads, through "assessment," "scaling down," and "wiping out," to understand the indiscriminate recommendations made as to the adoption in this country of transatlantic methods of finance and administration.

The rapid development of Argentina has been largely due to railway construction, and this country has formed one of the most profitable fields for British enterprise. The immense plains which constitute the greater part of the country favour cheap construction and easy haulage, and settlement and prosperity have mostly followed the lines. The Government has wisely given every facility to the foreign capitalist, and in spite of occasional checks from climatic or political causes, the return on the money invested has been unusually satisfactory.

The history of Mexican railways may be divided into two eras. The first line built, from the port of Vera Cruz to the capital, was a British enterprise, and the route was subsequently duplicated by the Interoceanic Company. An American invasion from the north followed, the Mexican Central and the Mexican National

forming lines of communication with the railroad systems of the United States. All the systems have been subject to the drawbacks attending operations in a somewhat sparsely settled district, with a depreciated silver currency added to the financial difficulties. The acquisition by the Mexican Government of large interests both in the Mexican National and Interoceanic systems marks a new chapter in the history of the railways of the Republic, and important developments may result.

CHAPTER II

RAILWAYS AND THE PUBLIC

RAILWAY RATES AND CHARGES

“**W**HEN the first railway Bills were passed, and the present system of railway legislation was gradually acquiring shape, the ordinary traffic of the country was conducted upon the roads and canals, and the new system offered to the country the option of an improved mode of transit, which was naturally accepted in the terms in which it was offered. Nor can it be doubted that railways were expected to be in practice what they are in contemplation of law, new highways freely open to the public to pass with engines and carriages at their own discretion.”

This extract from the report of a Parliamentary Committee of 1853 clearly defines the position which the pioneers of railways expected these undertakings to occupy in the general scheme of transport facilities of the country. Railways were to be improved roads, for the use of which the public were to pay tolls. In the natural order of events, however, railways have gradually become the only mode by which the greatest part of the internal communication of this country can be conducted, while considerations of public safety, and other circumstances, have placed their management and

use exclusively in the control of the companies owning them. Substantial reminders of the original idea are, however, to be seen in the large number of waggons belonging to private owners used in the coal industry.

The original scheme, therefore, was that railways should be limited in their *tolls* (using that term strictly), but that the charges for conveyance, whether paid by the public to railway companies or to the carrying firms, should be something beyond the tolls in order to cover carriers' services, risks, and profit—the amount of these charges being governed, not by any special enactment, but by competition between the railway companies and the carrying firms which used the railways.

As railways increased and the great systems began to grow up by amalgamation, a further limitation upon charges was imposed, and from about the year 1845 each Act prescribed a scale (calculated at per ton per mile) of maximum charges for conveyance. The scale was generally somewhat below the sum of the tolls chargeable under the earlier Acts for the use of the railway, for locomotive power, and for the use of waggons combined. To these maximum rates some of the companies were permitted to add a terminal charge for the services other than conveyance on the railway. This form of toll and maximum rate clauses has been followed from 1845 to the present time, with few amendments or variations.

In passing from the early primitive to the present more practical system, great advantages have on balance been attained, but some sacrifice was necessary of the

freedom with which individuals were able to exercise their choice of route, and to select the means of locomotion they employed. It has, indeed, been well said that "the early law of carriage by railway proceeded upon an anticipation of facts which experience has almost entirely reversed." It is not surprising, therefore, that in the early days the view was taken that legislative control of the regulations or charges of a railway company was to be deprecated as being in restraint of its rights as a trader, and an undue interference with the sanctity of contract. But whilst the judges deprecated parliamentary interference, they were in constant conflict as to the interpretation of the law applicable to these undertakings; and the last edition of *Boyle and Waghorn* gives an instructive account of some of the widely divergent views held by high authorities as to the position of railways in regard to their duties to the public.

Of late years, however, the principles of the law have steadily receded in importance, and the courts have been mainly concerned with the merits and facts of the cases before them, while the appointment of a special tribunal to deal solely with questions of transport by railway and canal, and with wide discretion in certain directions, has introduced an entirely new element into the legal history of railway enterprise in this country.

As in most other British institutions, science has had little to do with the evolution of the rates actually charged—as distinct from maxima—upon British railways.

Beautiful theories of equal mileage rates, a classification based on cost of transport, etc., have at various times been expounded, but the broad lines on which the actual tariffs of British railway companies have been regulated have been to ask of merchandise all it can justly be called upon to pay. It has been the aim of railway companies to make the rates conform to the requirements of trade, or in other words, "to charge what the traffic will fairly bear." Obviously the views of trader and carrier on such a point must often differ substantially, but in the long run reasonable figures in their mutual interests are ultimately fixed, railway officials being fully alive to the fact that the prosperity of their companies is closely associated with the prosperity of the industries they serve. They, in short, endeavour to suit their charges to the capacity of the traders, thus carrying out the intention of the Railways Clauses Consolidation Act of 1845, by which they are required "to accommodate them (the rates) to the circumstances of the traffic."

Before proceeding further, it will be well to trace roughly the origin and growth of a classification for the transport of goods in this country. Prior to the railway epoch, as is well known, goods were conveyed chiefly by canal, and for charging purposes a rude classification was adopted, which was taken as a guide in framing the classifications which appeared in the earlier Railway Acts. A Canal Act of a century ago provides that coal, stone, timber, corn, grain, malt, meal, flour, and other goods, wares, merchandise, and com-

modities whatsoever, shall be subject to a charge at the rate of $1\frac{1}{2}d.$ per ton per mile. Dung, soil, ashes, marl, and other manures at half the above rate. In this elementary classification there are only twelve enumerated articles. In the original Railway Acts there are from forty to sixty, divided into five or six groups. But with the expansion of trade, the growth of manufactures, and the application of science, new products came fast into the field, and the primitive classifications which sufficed for canals and the early railway days were found inadequate for the growing demands of commerce. The railway companies, recognising this difficulty, in 1847 framed a classification to govern through traffic, and enumerated and classified 326 articles. In 1852 the number had grown to 700, and in the year 1890 to 4,000 entries, or, leaving out duplications, to about 2,500 separate articles. The latter classification was taken as the basis for that deposited with the Board of Trade, in compliance with the Act of 1888, but the number of articles was reduced by the omission of qualifying words — such as “common,” “in the rough,” “old,” “unfinished,” etc.—and by the expunging of duplicate entries of compound words, to a total of about 1,400 articles.

Parliament, having authorised every railway built in this country, and granted the special privileges each enjoys, has naturally kept careful watch that the companies should not take unfair advantage of the public. With the national industries developing by “leaps and bounds,” the conditions of railway working and charging

have at various periods required full investigation, and it may be safely said that no trade has been so amply and frequently inquired into by parliamentary committees as the great transport business of the country, and it must also be freely admitted that few industries could have emerged from these ordeals with more credit.

The inquiries were often demanded on grounds of complaint, which on investigation were found to be based on misunderstanding of the powers of the companies, or what they could be reasonably asked to perform. Nevertheless, these inquiries produced advantages for the public and checked unfair use of the powers and privileges possessed by the companies, and the reports of the various committees form a valuable record of the progress of our railways from their very early times down to to-day.

Space will not permit of detailed reference to these parliamentary reports, which cover most departments of railway working, but special reference must be made to that of the Committee of 1872, as the Act of the following year, based on its recommendations, constituted the Railway and Canal Commission, with the view to giving traders a specially qualified tribunal to hear their complaints against railway companies. In 1881-2, the year before the expiration of the second term of the 1873 Railway Commissioners, another House of Commons Committee inquired into the working of this tribunal and as to the then existing relations between the traders and the companies.

This inquiry proved to be a very wide and exhaustive

one. Various recommendations were made, amongst others that the Railway and Canal Commission should be made permanent, which was done by the Act of the following year, notwithstanding the comparatively few cases that had been brought before it. "Its utility is," the Committee claimed, "not to be measured solely by the instances in which it has been called upon to hear and determine, but also by the deterrent and controlling influence of its existence."

This Court consists of two Commissioners appointed by the President of the Board of Trade, and three *ex-officio* Commissioners judges of the Superior Courts, one nominated for England, one for Scotland, and one for Ireland by the Lord Chancellor, the Lord President of the Court of Session, and the Lord Chancellor of Ireland, respectively. The working of this tribunal has on the whole given general satisfaction both to the traders and the railway authorities. It may be added that the 1881-2 Committee expressly stated that "on the whole of the evidence they acquit the railway companies of any great dereliction of duty to the public."

THE RAILWAY AND CANAL TRAFFIC ACT, 1888

It has been stated above that the railway industry has been subject to many inquiries before committees whose recommendations have generally formed the basis of legislation. To deal with the whole of these inquiries adequately would require more space than is available in a work of this scope, and it must suffice to

refer broadly to the recent legislation which governs the principal sections of the railway companies' present powers, and more especially their powers in regard to the rates charged for the goods and minerals conveyed, and also to indicate the protection given to the public against unfair charges.

The Act of 1888 provided that "every railway company shall submit to the Board of Trade a revised classification of merchandise traffic and a revised schedule of maximum rates and charges applicable thereto proposed to be charged by such railway company, and shall fully state in such classification and schedule the nature and amounts of all terminal charges proposed to be authorised in respect of each class of traffic, and the circumstances under which such terminal charges are proposed to be made."

Accordingly, on the 9th February, 1889, the railway companies of the United Kingdom lodged with the Board of Trade a revised classification of merchandise and schedule of maximum rates, which they proposed to adopt. The work was one of colossal magnitude, and few persons had any idea of the amount of labour cast upon the officials of the railway companies in complying with this order. At the date of the inquiry there were in this country at least 18,000 railway stations, and there were 40,000 pairs of these stations between which business was actually transacted, which came under the supervision of the Clearing House, and the settlement of the receipts from which gave employment to an army of clerks and other officials connected

with the Clearing House. Sir Richard Moon at one time stated that in the case of the London and North Western alone the number of rates between stations on that line was over 20,000,000. The companies' rates were authorised under very many different Acts of Parliament; the widest possible divergence existing among them, both as to the classification and the rates to be charged. All the Acts under which railways had been constructed specified articles of merchandise and minerals to be carried at certain rates, according to the classes to which they were allocated, and the classification and the rates differed in many instances widely. It had been the desire of the railway companies—even in a greater degree than that of the traders and the public—to simplify and make consistent the classification, and reduce as far as possible the number of differences in the rates which they were authorised to charge. The efforts made in this direction caused the working classification, as agreed by the railway companies, to include some thousands of articles, grouped and ranged under five distinct classes, denoted by figures 1 to 5, and two others known as "M" and "S"—the former including "minerals," and the latter such goods as generally pass from "station to station only," in large quantities, such as grain. Some idea of the very miscellaneous descriptions of articles carried by railway may be formed from the fact that there were more than 200 items grouped as "explosives and other dangerous goods," and under the head of "hardware" there were nearly as many, such as "nut-

crackers," "dust-pans," "coffin-furniture" and "fire-guards," "hand-cuffs" and "Jew's-harps," "corkscrews" and "sardine-tin-openers," "sugar-nippers" and "warming-pans."

Between the different stations the number of separate rates could only be represented by such utterly unrealisable figures as one is accustomed to see in astronomical calculations. A writer in one of the American journals, when discussing the possibility of adopting in that country the system of the Railway Clearing House of Great Britain, made the following very interesting calculation:—

"Assuming that there is a station on this 50,000 miles to each 8 miles of road, there would be 6,250 stations. To make one rate between all stations would require (6,250 multiplied by 3,125) 19,531,250 rates for each class of freight. In the western classification there are twenty different classes. Now multiply 19,531,250 rates to each class by twenty, the number of classes, and the grand total of 390,625,000 separate rates is the enormous result. Imagine a board of fifty presidents or fifty general managers sitting round a table and guessing out unanimously and writing down 390,625,000 separate and distinct rates. If they guessed out one rate a minute, which is good guessing, in one year, working ten hours per day, including Sundays and holidays, they would have guessed 218,400, and at the same pace, in 1,799 years they would have completed their first tariff."

The work of re-classification was not new to our railway companies. Railway officials had for years endeavoured to simplify these matters, and educe something like order out of the existing chaos, produced, be

it remembered, not by the action of the railway companies, but by a Legislature which undertook the task of deciding upon the terms and conditions under which the railway companies were to conduct their business as common carriers. In 1885 the railway companies did, at the cost of much time, trouble, and expense, prepare amended classifications, and embodied them in bills which they presented to Parliament, but which Parliament declined to read or wade through a second time. The Railway Clearing House classification, in force prior to 1888, contained the names of 2,753 distinct articles. The new classification, lodged with the Board of Trade under the Act of 1888, was based upon this Clearing House system, but with some very important simplifications. Thus "oils," which occupied two columns and included some fifty different descriptions, were reduced to two lines. Among other changes, "live rats in cages" disappeared, and pimento and ketchup were no longer distinguished from other spices and sauces. Among other names missed by etymologists from the new classification were Munjeet, Mungo, Tincal, peggies and dollies, cullet, quarls, divi-divi, myrabolams, and other matters, for the nature of most of which we must refer the curious in such matters to the Natural Products Department of South Kensington. At all events, these articles no longer enjoyed the honour of individual mention in the classification lists of our railway companies, and these and many other recondite articles were omitted from the revised classification of the railways as submitted.

The revised classifications being duly lodged, the Board of Trade invited objections, and received no fewer than 1,530, emanating from the most important trading bodies throughout the country. Foreseeing the enormous difficulty of reconciling conflicting interests covering so wide an area, they suggested to the railway companies to arrange meetings with the traders, and endeavour to come to an understanding, with a view to lighten the labours of the Department. The companies adopted the suggestion, and arranged to meet the traders, combining, as far as they were able, the various bodies representing particular industries in groups, so as to avoid repetition of arguments. As a result, 79 meetings took place in England, 31 in Scotland, and 14 in Ireland. These meetings, which commenced in June, 1889, were continued during a considerable time, and were productive of much good by the interchange of views, in placing before the companies many facts relative to trades of considerable importance and value, and in opening the eyes of the traders to the great difficulties of the task, and disabusing their minds of many erroneous ideas. Concessions were made by the companies, and the original classification was revised in many respects, whilst upwards of 200 additions were made.

As, however, there appeared to be no hope of a complete agreement, and as some important bodies, such as the Lancashire and Cheshire Conference and the Mansion House Association, held aloof, the Board of Trade decided that all objections to the latest issue

of the revised classification (dated December 10th) must be made in writing on a prescribed form, and submitted to them ; that the companies must consider the objections, and, dealing with each separate article, state their reasons for failing to comply with the requests of the traders, and submit their answers not later than 19th March. Continuous sittings were held by the goods managers day by day. The number of entries was increased to about 1,800, and the margin between the statutory or maximum classification and the new classification thereby considerably reduced.

After further conferences with the traders, there was left a clear issue. Each objection had to be considered, article by article, and in the event of continued non-agreement, the class was to be fixed by the Board of Trade, for which purpose were held many hearings under the presidency of Lord Balfour of Burleigh and Sir (then Mr.) Courtenay Boyle, now deceased. The responsibility of the decision was great, as in fixing the class, and as a sequence the maximum rate of every product of the country, a shrewd knowledge was required of commercial prices, of the various modes of packing, of the risks of transit, of bulk as compared with weight, etc., the neglect of any of which considerations might result in a decision unfair to one party or the other.

It also devolved upon the Board of Trade to consider and amend according to their judgment, after hearing evidence from both sides, the maximum rates and charges included by the companies in the schedules

they had submitted, to be applied to the various articles as finally classified.

This led to much evidence by the railway companies and the traders, and lengthy discussions between the very eminent counsel engaged by the two parties, not only with regard to the rates per mile to be allowed to the companies for the actual conveyance of the traffic, but particularly as to the reasonableness of permitting them to make separate fixed charges for terminal services and accommodation.

The last public sittings of the Board of Trade inquiry were held in May, 1890. During the hearing no fewer than 43,657 answers to interrogatories were given in evidence, innumerable statements and diagrams were put in, questions of procedure settled, and the many points of difficulty arising from time to time decided. The minutes of proceedings, including speeches by counsel, extended to 3,728 pages, and the minutes of the thirteen sittings on "classification" cover 709 pages. The inquiry was of wide scope, embracing in the discussion on classification articles from "beetle traps" to "costly velvet," from "pins" to "heavy castings," and in the general inquiry, learned disquisitions on the measurement of timber by "string," "tape," or "calliper," the distinction between calves and animals, sheep and lambs, and the existence or non-existence of "a fish ring." But, although the labours closed to the public gaze, the hardest part of the Board of Trade task had to be accomplished in balancing, sifting, and utilising the enormous mass of evidence and details, and in

giving due and not disproportionate weight to the facts and figures submitted to the tribunal, so that the information given in the earlier and middle stages should not be overshadowed or weakened by the later evidence coming more freshly to the memory.

In due time the classifications and schedules of rates and charges as passed by the Board of Trade were embodied in provisional orders, and after being very fully considered and further amended by a joint committee of both Houses—ably presided over by the late Duke of Richmond—they were finally passed by Parliament, some in 1891 and the remainder in 1892, and became, as from 1st January, 1893, the bases of the railway companies' rates and charges. As indicating the magnitude of the work, it may be mentioned that this joint committee held no less than forty-eight sittings in 1891, and sat again from 21st March to 24th May in the following year.

Another chapter to record in the history of railways commences with the agitation organised by the traders against the manner in which the companies used their powers under the new Acts, and which led Mr. Mundella, then President of the Board of Trade, to move in the House of Commons, on 16th May, 1893, "that a select committee be appointed to inquire into the manner in which the railway companies have exercised the powers conferred upon them by the Railway Rates and Charges Order Confirmation Acts, 1891 and 1892, and to consider whether it is desirable to adopt any other than the existing means of settling differences arising

between the companies and the public with respect to the rates and conditions of charge for the conveyance of goods, and to report what means they recommend."

An attempt was made to place Mr. Mundella on the committee as chairman, and thus make the Board of Trade practically responsible for the proceedings—a responsibility which the President, however, emphatically declined, and Mr. Shaw-Lefevre was appointed chairman.

After lengthy inquiry the committee issued their report in December, 1893, as to the manner in which the companies had exercised the powers conferred upon them by the Railway Rates and Charges Acts of 1891 and 1892. They thought that the rates not reduced by the new maxima should have been left untouched, and they "cannot but think that the course of the companies was mainly actuated by their determination to recoup themselves to the fullest extent by raising the rates of articles where the maximum rates were above the actual rates." The justification urged by the railway companies was that there was no reason why they should have meekly submitted to be robbed of a portion of their revenue, by reductions in rates, of twopences and threepences, which would not be felt or appreciated by the trader, but which, spread over a large amount of traffic, would entail great loss on the shareholders. Had the course of action recommended by the committee been adopted, the companies would have been tied down to the rates they permitted to remain in force, and would have had

no opportunity of recoupment. They would have had to bear the burden of the loss on rates compulsorily reduced, without hope of compensation. For, under the Act of 1888, no rate could be raised except by previous advertisement, and opportunity being afforded to the trader of appealing against it; leaving out of question the large expense and immense amount of trouble in advertising the rates, there was no question that wholesale protests would have been raised, and that a settled revision would have been indefinitely prolonged. What could the companies do, they urged, in face of the short time allowed them for readjustment, other than the course they pursued of permitting, to a great extent, the class rates to stand in their books until time and opportunity were afforded of deciding upon special rates consistent with the altered conditions? The directors and officers of the companies were, it was claimed, bound to treat their undertakings as commercial concerns, and to do the best they could to prevent loss of revenue.

The recommendations of this committee were embodied in an Act of the following year, which provides that if a complaint is made, it shall lie on the company to prove that any increase of rate or charge is reasonable. The procedure prescribed is a complaint to the Board of Trade, with the right to the trader to appeal to the Railway and Canal Commission, if no agreement between him and the company results. Many complaints of the kind were duly lodged with the Board of Trade, and negotiations took place before

them during the four following years, the general result being that the companies effected many compromises with individual objectors. Two important cases arising out of these increases came before the Commissioners : one the Mansion House (Northampton) case, covering the increase of 5 per cent. in the rates between Northampton and London and the increased scale of charges for small packages which the applicants hoped would be accepted as a test case ; but the decision was not so treated, and hence the necessity for the second case, viz. Smith and Forrest *versus* the London and North Western, Midland, Great Western, and other companies. The complaint in this case, stated in general terms, was that a large number of the rates charged to and from Manchester and Liverpool had, as from January 1st, 1893, been unreasonably increased, either directly or indirectly, by the reduction of cartage rebates or in other ways. The fact was undisputed, but the companies claimed to justify the advances by showing the increase that had taken place in the expenses of working the traffic, due to the enhanced price of labour and materials. Such a justification obviously applied not merely to the traffic of the particular applicants, but to the whole of the goods and mineral traffic of the United Kingdom, and to future as well as past increases of rates. Hence the importance which attached to the proceedings and the keenness with which the issues were fought out.

In their judgment, delivered in May, 1900, the Commissioners did not see their way to go back so far for

a basis of comparison of the costs of working as the companies were desirous of doing, for they thought 1872, when a large proportion of the old rates were fixed, or even 1880, too remote, and they fixed upon the year 1888 as a fair starting-point from which to measure the increase in expenses, and compared it with the year 1891. On this basis they arrived at the conclusion that the companies were justified in an increase in the rates complained of—not exceeding 3 per cent.—as compared with the 5 per cent. which they had imposed. The Commissioners had such a wealth of statistics before them that they were bound to make a choice amongst them, and they had some ground for complaint in the fact that the figures submitted by the different companies were not prepared on the same lines. For instance, one company attempted to discriminate between the cost of working goods and mineral traffic (always a difficult problem), while the representatives of the other lines concerned made no such attempt, and it would have been better policy if all the figures had been prepared on a uniform basis.

In the case of the London and North Western, it was shown that the proportion of working expenses to gross receipts, which in 1872 was 46·31, had grown in 1880 to 48·90, in 1890 to 52·42, and in 1892 to 54·56. The applicants tried to take up the position that though they might not be in a position to dispute the fact of the increase in working expenses, it was not material, because to justify an advance of the 1892 rates the

increase must be shown to have occurred subsequent to January, 1893. The Commissioners, however, in their judgment brushed aside this contention, and showed no unwillingness to take into consideration the fact of an increase in working expenses having occurred between 1893 and some date anterior to that year. The great contention, therefore, arose upon the date which should be taken for purposes of comparison, and upon the accuracy of the figures, which was impugned, and the Commissioners devoted great pains to the endeavour to obtain reliable data for their judgment, once adjourning the case for the preparation of further statistics.

In arriving at the cost of working goods and mineral traffic one difficulty always presents itself, which is a familiar one to experts in railway statistics, and that is, in the case of many items of expenditure of a railway, to determine what proportion of them is chargeable to any particular description of traffic or district. The cost of maintenance can to some extent be dealt with, because the number of trains of each description is a certain basis; but take the men employed at small stations who are engaged in dealing with both goods and passenger traffic—who shall say what proportion of their wages is chargeable to goods traffic, and what proportion belongs to passenger traffic? Take a station approach which leads both to the passenger station and to the goods dépôt, and is used in common by passengers on foot, passengers in vehicles, and goods drays. It costs something to maintain, but who shall say how much of the cost should be borne by the goods traffic? Such

illustrations might be multiplied many fold, but the difficulty, which is an admitted one, was met by the companies by a series of ingenious calculations which presumably satisfied the Commissioners, as they showed themselves willing to accept the result.

These cases show how the traders are protected against an unreasonable general advance of rates, whilst they are similarly guarded against increases of individual rates. The Act of 1888 provides that "where a railway company intend to make any increase in the tolls, rates, or charges published in the books required to be kept by the company for public inspection under section 14 of the Regulation of Railways Act, 1873, or the Railway and Canal Traffic Act of 1888, they shall give by publication in such manner as the Board of Trade may prescribe at least fourteen days' notice of such intended increase, stating in such notice the date on which the altered rate or charge is to take effect, and that no such increase in the published tolls, rates, or charges of the railway company shall have effect unless and until the fourteen days required under the said section has been given." The interests of the traders are further safeguarded by the Act of 1888, by what are known as the conciliation clauses, under which complaints can be made to the Board of Trade, whose officials then place themselves in communication with the company or companies concerned, and, having carefully weighed all the representations made by the parties, endeavour to bring about some mutually satisfactory settlement, and thus save the expense of the

case being brought before the Railway Commissioners for decision.

These cases are heard quite informally, and the periodical reports made to Parliament by the Board of Trade show that in large numbers of instances their efforts at conciliation meet with success.

PREFERENTIAL RATES

The settlement of rates and classifications made under the Act of 1888 has, on the whole, proved a fair one for both traders and the railway companies, and practically the only class of charges which continues to cause dissatisfaction in certain quarters, mainly with the agricultural interests, is that which gives, it is alleged, lower terms to foreign products than those which British producers of the same class pay. The case is, on the face of it, a difficult one: for example, why should American meat be carried from Liverpool to London at a lower rate than British meat from a station less distant from London than Liverpool, or foreign hay arriving at Southampton receive similar "preferential" treatment over the English growth? If, it is argued, it pays the railway company to carry the American meat from Liverpool to London, and the foreign hay from Southampton to London at certain rates, why should British producers be charged higher figures?

The answer of the railway companies is necessarily of a somewhat expansive character. In the first place, it is contended that it is not fair to base a rule on ex-

ceptional circumstances. With grass running short, and the prospect of having to feed his beasts in the yards through the winter months, it may suit a farmer to sell his stock cheap, but he would be naturally indignant if it were suggested that such forced sales should fix the prices of his cattle for the next twelve months. Again, at the close of each season it may suit the large firms of drapers to clear off stocks at prices greatly reduced from their ordinary ticketings; but no one would suggest that as the reduced levels left margins of profit they should be taken as the normal standards. In the case of the railways Parliament has authorised certain charges which, after careful consideration, it was decided would yield a fair profit to the railway companies; but if the ordinary rates as against sea freight would cause goods consigned (say) to London to go all the way to that port by water, it is contended that a railway company may fairly say, "Rather than get nothing out of this traffic, we will take a lower than our normal rate and have the goods landed (say) at Liverpool, and so get something out of it."

The cost to the foreign shipper is the same, but instead of shipowners securing the whole cost of transport the railway company comes in for a share. The foreign goods could be placed on the market without the help of the railway company, so that the British producer would have to face the competition were there no sea-railway route.

The rates from Newcastle to London are governed by the charges made for carriage by steamer. The

railways can only charge so much more than is charged by the steamers as is represented by the extra convenience and speed afforded by them, otherwise all the traffic would go by sea. The charge for carriage of meat from Liverpool to London is 25s. per ton, while from intermediate stations it is 40s. per ton. This seems unduly to favour the foreigner. But let us look closely at the position. Suppose the railways said they would not carry at less than 40s. In that case American meat would not come by the railways, but would come direct from New York to London; therefore American meat would be delivered in London, to compete with English meat, just the same as if it had been carried from Liverpool to London by the railways. Who would then have gained by the practical refusal of the railways to carry the traffic? Not the traders, as they would have to endure the competition whether the railways carried the meat or not—in fact, if it went all the way by water the cost would be less and competition therefore keener. The only result in fact from demanding 40s. would be that the railways would lose whatever profit they may be able to get on the 25s. rate. In the United States an attempt has been made by what is known as the “short-haul” clause of the Interstate Commerce Act, to prohibit charging more for part of a given route than for the whole; but the clause is not very stringently enforced, and it is, in fact, considerably qualified by the addition that the practice should be considered unlawful only when the short-haul freight is carried under “substantially similar circumstances and

conditions" to those under which the long-haul freight is carried.

It is very difficult to fix a rate which will be a reasonable one in the opinion both of the trader and of the railway company, though, as a matter of fact, the companies have succeeded in working harmoniously with the great majority of their customers. A very clear proof of the difficulty attaching to fixing "reasonable" rates is the trouble encountered by the Board of Trade in establishing even maximum rates, which have already been explained, for it is evidently a much simpler matter to fix maxima than to fix actual rates. While the traders may fairly claim to have reasonable rates, it must not be forgotten that the railway companies themselves are trading corporations, and subject to the same necessity as the traders of paying their way.

The justification for differential rates on foreign import goods—against special export rates there are few objections raised in the country in which they exist—is, in fact, to be found in sea competition—direct sea competition and the competition between port and port—but mainly in the different conditions under which foreign goods arriving in large quantities are offered to the railway companies for transport. Everyone now understands that it is cheaper for a railway company to run a train of fully loaded trucks from point A to point B, than to start with a comparatively light load and stop at numerous wayside stations to fill up the trucks and pick up others, and that the nearer trucks can be loaded to their full capacity, the less is the cost of

conveyance. Much of the foreign produce carried at lower than the normal rates is delivered to the railway companies at the port of arrival in train-loads, or sufficient quantities to fill several trucks. "Let," the railway companies say, "British producers combine and give us their goods in the same wholesale quantities, and as conveniently packed as the foreign shipments, and we will quote the same rates."

As above stated, the Board of Trade have power to inquire into all complaints as to alleged preferential rates, and failing satisfaction from such an application, the party aggrieved has the Railway Commission to inquire into his complaints and do him justice. The fact that very few complaints of this character have been lodged with the authorities, and that none have of late years been carried to the Railway Commissioners, seems to suggest that those who charge the companies with making illegal rates of this character are not very sure of the merits of their case.

It is worth noting that the American railways adopt the same methods to secure import business, and it results in consequence that the British exporter may be able to lay down a certain article in Chicago at a lower transportation charge than that on the same article if produced in New Jersey. Mr. Lucius Tuttle, President of the Boston and Maine Railroad, has explained that

"the real reasons why import rates are made lower than domestic rates are the commercial necessities of the country's business. If we were to begin anew establishing domestic and import freight rates, and should appoint a committee to

represent all of the great railroad systems doing business in this country, the decision would, I think, unanimously favour giving import traffic a less rate than domestic traffic, for the purpose of equalising distances on import as well as on export traffic, as has been found necessary in dealing with the general subject of domestic rates. For instance, in making the rate from New York or Boston or Philadelphia to a distant common point in this country there is never an attempt to make a scientific tariff based on ton and miles. To a common western point Buffalo may pay as high a rate as Boston without resultant discrimination against Buffalo or in favour of Boston. It is a duty of transportation companies so to adjust their freight tariff that, regardless of distance, producers and consumers in every part of this country shall, to the fullest extent possible, have equal access to the markets of all parts of this country and of the world. If we are to become extensive sellers of our goods in the markets of the world, we must be buyers in those markets. We must furnish export transportation to those markets ; we must supply traffic to ocean lines from the ports of the United States to the ports of Europe. If onerous customs duties or excessive freight tariffs, or both, make it impossible to buy goods in foreign markets and resell them in our markets, then shall we have no import business ; and if we have no import business to fill the cargo-carrying capacity of our inbound transatlantic ships, then a higher rate must be levied by them on the outbound traffic, or they will become profitless and our export traffic be discontinued. Therefore this whole matter of adjusting the relations of import and domestic rates becomes a commercial question, and not one of competition only between the various seaports of this country and their allied transportation lines."

Considerable misapprehension often prevails as to the actual facts about rates for home and foreign produce.

Complaints are, for instance, often made that Irish railways do not treat Irish butter fairly, having regard to Danish competition, but it has been recently shown that, taking the Manchester market, the rate by the State railway of Denmark runs from 5*s.* to 7*s.* per ton on full waggon-loads of 10 tons for an average distance of 60 miles ; cartage to and from cold stores, 4*s.* per ton ; freight to Grimsby or other English ports, 25*s.* per ton ; while the rate on the English railways from port to market is about 20*s.*, making a total of 55*s.* per ton. The existing rate from Limerick to Manchester is only 37*s.* 6*d.* per ton collected and delivered, and in small quantities, and of this the Great Southern proportion is only 15*s.* for 129 miles. It is true the Continental steamers are subsidised to the extent of 10*s.* per ton by the Danish Government ; but even with that reduction the Danish producer actually pays 45*s.* per ton carriage, against 37*s.* 6*d.* per ton from Ireland. The unit of economy in carriage is the full waggon-load. One of the most essential things for farmers is to present the traffic to a railway in larger consignments and at regular intervals.

BASIS OF RAILWAY RATES

In concluding these remarks on the subject of railway rates, it may be worth noting that rates cannot be based on cost of service. It is simply impossible to say what is the cost of service of a particular article, especially when it forms only part of a truck-load. If a variety of goods are carried in the same train, how is it possible to

say what each kind of goods costs to carry? Even if it be admitted that the total expense of running a particular train may be estimated pretty closely, how is it to be divided?

If all freight were to be charged full cost of service, plus a full profit, a good deal of freight would not be carried at all. Coal and manure must be carried at such rates as the profit accruing to the trader will permit of; otherwise they will stop at home. If the railway companies charged the full share of expenses, plus uniform profit, it would in many cases be prohibitive; on the other hand, a rate which would be prohibitive on coal would not be felt on silk. Silk can afford to pay, besides its own movement, expenses and profit, the same share of profit which, on a principle of mathematical equality, ought to be debited to the manure; but the latter could not bear it, hence the necessity for differentiation. The true basis of rates should be the value of the service rendered, not its cost. That this principle is for the benefit of the coal and manure goes without saying, and it is equally true—though not, perhaps, equally obvious—that it is for the benefit of the silk for the manure to pay its own movement expenses, and some small contribution towards fixed charges and interests on capital besides. More it cannot pay. If more is charged, it ceases to travel, and the high-class commodities will then be obliged to pay the whole of the interest on the capital of the companies unaided.

Charging what the traffic will bear—or, as it has been

better expressed, "not charging what the traffic will not bear"—is really, properly understood, a maxim, not of extortion, but of moderation and restraint. It is a railway translation of Sterne's dictum that "the wind is tempered to the shorn lamb." What a railway manager has to do is to make rates that shall return a fair average profit on the whole business of the railway. A very important point which has to be considered in determining rates is competition—competition either by rival lines or by water routes. If, of two lines running to the same point, one possesses a shorter or cheaper route, it fixes the rate, and the other cannot charge more, or it would not get any traffic. In such a case, if, as the line is there, it can carry at any profit over movement expenses and those of loading and unloading, it is to the interest of the company owning the longer route to take the traffic. Half a loaf is clearly better than no bread.

Railways are a necessity to trade, and—until they are acquired by the State and are run entirely in the interests of the public without regard to their profit-earning powers—it is desirable that the companies should earn a fair return on the capital invested as industrial undertakings, or otherwise investors will not come forward with the funds for providing necessary extensions and improvements. It has been shown that the interests of traders are amply protected under existing Acts, and Parliament should be careful not to impose burdens which will cripple this great industry.

LIGHT RAILWAYS

In 1895, Mr. Bryce introduced into the House of Commons a Bill giving county councils powers to act as promoters and constructors of light railways. This measure did not, however, pass, and in February, 1896, Mr. Ritchie, then President of the Board of Trade, brought in a Bill, the main features of which were the constitution of a Light Railway Commission to inquire into all projects of this class submitted to it, and giving the Treasury power to grant subsidies to such schemes as could not, owing to the poverty of the districts to be served, be carried through without such assistance. In introducing his Bill, Mr. Ritchie explained that the Government did not propose the measure as a panacea for the evils of agricultural depression, but, although they could not call this an heroic measure, he hoped it would benefit both producers and consumers by bringing them more closely together. The Government had come to the conclusion that light railways would not be made in the districts where they are most needed without some aid from the locality and from Parliament. They thought the co-operation of the State, of the localities, and of individuals outside the local bodies was necessary in order to secure the effectual working of a bill dealing with the construction of light railways. In France the light railways were secondary lines constructed on much the same plan as the main trunk railways, the only

difference between them being that of a gauge. In Belgium, on the other hand, the system might be described as one of steam tramways. The Belgian seemed to be greatly superior to the French system from many points of view, but the Bill provided for either of the two plans being adopted. In Belgium light railways cost on an average about £3,000 a mile ; in France the cost was very much greater. The chief difficulties in regard to light railways in Great Britain had been—first, the unwillingness of Parliament to authorise the compulsory acquisition of land otherwise than by schemes directly approved by Parliament ; and, secondly, the expenses consequent on the demands for public safety. With regard to the first, he earnestly hoped Parliament would not insist upon keeping in its own hands the sanctioning of schemes for light railways. Secondly, the public must make up their minds, if they wished to have light railways, to exercise some amount of self-protection and not to insist upon the elaborate precautions adopted on the trunk railways, where the speed of the trains was high. The Bill provided that the sanction of Parliament should not be required for the compulsory acquisition of land for the purposes of a light railway.

A scheme for such a railway might be proposed by a local authority—*i.e.* by a municipal, county, or district council—by a railway company, by a tramway company, by a company *ad hoc*, or by a combination of all these. A Light Railway Commission was to be set up consisting of three members, who would

have to consider the expediency of granting applications, and would submit a draft order to the Board of Trade for confirmation. This order, when confirmed, would have the same effect as if it had been enacted by Parliament.

The Bill guarded against any attempt to apply its machinery to the promotion of great lines of railway, and also against lines being made on this cheap and easy system which should unreasonably and improperly compete with existing lines. The Government proposed to devote £1,000,000 to the objects of this Bill, and that sum would be available in two different ways. A portion would be available for special advances under special circumstances, and another portion would be available for the granting of loans to facilitate the making of these lines. It was intended that the Treasury in the case of poor localities might make a grant either as a gift or in any other way which might be for the interest of the localities. The other way in which the Government proposed to give help was where local authorities contributed capital, and the Government might also contribute a certain amount, but it must not exceed 25 per cent. of the whole capital required for the making of the railway. A certain amount of capital must be subscribed by persons outside any local authority. The outside public, the local authority, and the State must all be joined together when the State found a portion of the capital. The Government contribution would be in the form of a debenture loan, and it would rank *pari passu* with the

debenture loan of the local authority. The interest would be fixed at $3\frac{1}{2}$ per cent. In conclusion, the right hon. gentleman expressed his belief that the railway companies and the landowners would assist in the promotion of schemes for the construction of light railways.

The Bill in due course was passed, but in its actual working the Treasury and local authorities have given but little substantial support to this form of enterprise, which has been left mainly in the hands of private promoters.

The rules made by the Board of Trade with respect to applications to the Light Railway Commissioners for orders authorising light railways, provide that notice of intention to apply for an order must be published by advertisement in each of two consecutive weeks, in the month of May, or of November, in at least one local newspaper circulating in the area through which it is proposed to make the railway. The notice must describe generally the line of the railway, its termini, the land proposed to be taken, and the gauge and motive power of the railway, and must be subscribed with the names of the promoters. It must also name a place where a plan and section of the proposed works (with a book of reference to the same) and a plan of the lands to be taken may be seen. Copies of the draft order, plans, book of reference, section, and estimate of cost of construction must be deposited by the promoters during the months of May or of November with the clerk of the county council and of every borough,

district, and parish council through whose area the railway is proposed to be made, and also with the Board of Trade. Copies of the draft order must be deposited with the Treasury, the Board of Agriculture, the Postmaster-General, the Commissioners of Customs and Inland Revenue, the Admiralty, the War Office, the Office of Woods and Forests, and the Office of Works, and, in the case of proposed railways in Scotland, with the Secretary for Scotland. Detailed regulations as to the preparations of the plans and sections are given in relation, *inter alia*, to bridges, level crossings, alterations of levels, embankments and cuttings, tunnelling and junctions.

It is further provided that during the month of May or of November the promoters must serve a notice on the owners or lessees and occupiers of all lands intended to be taken, requesting that any objections may be stated. Similar notices must also be served on any railway, tramway, or canal company whose line will be crossed or otherwise interfered with by the proposed railway. There is also provision for notices being given in case of relinquishment of works or repeal of the protective provisions in a former order. Finally, a form of the estimate to be submitted, with details as to the authentication and service of notices, is given; and the fee payable by the promoters to the Board of Trade, before lodging any application, is fixed at £50.

The Act of 1896 provided for the appointment of three Commissioners, of whom only one was to be

paid ; but on the expiry of their powers at the end of 1901, such powers were extended under the Expiring Laws Continuance Act, and by a separate measure provision was made for the payment of a second Commissioner. Work has been done by this tribunal cheaply, expeditiously, and to the general satisfaction of all who have appeared before them. Applications are divided by the Commissioners into four classes, viz. (A) lines on lands acquired, mostly steam motive power ; (B) lines on public roads, mostly electric motive power ; (C) neutral ; and (D) amending orders. The totals to the close of 1902 are divided amongst these classes as follows, so far as those approved are concerned :—

Lines on	No.	Mileage.	Engineer's estimate.
Lands acquired .	99 ...	1,056 $\frac{1}{4}$...	£6,217,623
Public roads .	119 ...	583 $\frac{1}{8}$...	5,605,162
Neutral .	2 ...	29 ...	312,235
Amending .	22 ...	— ...	53,213

A very satisfactory feature of the inquiries before the Commissioners has been the firmness with which they have rejected attempts to secure powers to compete with railway companies which were never contemplated when the Act appointing the tribunal was established, or to obtain sanction to purely urban tramway undertakings. Several attempts have been made to secure authority for schemes which should have been presented to Parliament under the ordinary rules of procedure.

The last report of the Commissioners gives tables summarising the excellent work done from 1896 to the

close of 1902, from which the following table is compiled :—

31st Dec., 1902.	Number.	Mileage.	Engineer's estimate.
Approved . . .	242 ...	1,668 $\frac{3}{8}$...	£12,188,233
Rejected. . .	93 ...	1,168 ...	9,424,701
Withdrawn . . .	63 ...	713 $\frac{3}{4}$...	5,035,553
Deferred . . .	2 ...	2 $\frac{1}{2}$...	110,452
Not dealt with . . .	20 ...	79 $\frac{1}{4}$...	620,320
Sent to Board of Trade 212*...		1,501 $\frac{1}{8}$...	10,148,934

A summary of the aggregates of the fourteen half-yearly applications as published in June and December, not as revised for the Commissioners' annual report, including the returns for June, 1903, is subjoined :—

Total applications . . .	.	.	.	†442
„ mileage . . .	.	.	.	4,020 $\frac{3}{4}$
Steam, number . . .	.	.	.	†155
„ miles . . .	.	.	.	1,913 $\frac{1}{4}$
Electric, number . . .	.	.	.	247
„ miles . . .	.	.	.	2,068
Hydraulic, etc., number . . .	.	.	.	4
„ „ miles . . .	.	.	.	39 $\frac{1}{2}$
Gauge 4 ft. 8 $\frac{1}{2}$ in., number . . .	.	.	.	‡278
„ „ „ miles . . .	.	.	.	2,954 $\frac{1}{8}$
„ 4 ft. number . . .	.	.	.	8
„ „ miles . . .	.	.	.	90
„ 3 ft. 6 in., number . . .	.	.	.	106
„ „ „ miles . . .	.	.	.	903 $\frac{1}{2}$
Other gauges number . . .	.	.	.	15
„ „ miles . . .	.	.	.	153 $\frac{1}{2}$

* Included in 203 orders.

† Two applications covered one section of 4 feet 8 $\frac{1}{2}$ inches, and another of 3 feet 6 inches.

‡ Three either steam or electricity.

§ Two applications covered sections of both 4 feet 8 $\frac{1}{2}$ inches and 3 feet 6 inches.

Thirty-six applications did not involve the construction of mileage. It will be seen that the total number of applications now reaches the respectable figure of 442, involving a mileage of $4,020\frac{3}{4}$, divided practically between $1,913\frac{1}{4}$ miles of steam and 2,068 electricity, while $39\frac{1}{2}$ miles are worked by hydraulic or other mechanical power.

The working of this tribunal has been an interesting experiment, as it is the first instance of Parliament transferring to any other body its powers of dealing with the rights of landowners.

THE SAFETY OF RAILWAYS

So far as the safety of the public is affected by railway working, Parliament has bestowed the most ample powers on the Board of Trade. No line can be opened until it has been inspected by a representative of the Board, whose officials also hold inquiries into serious accidents, and require accurate returns as to all casualties which occur, whether involving loss of life or injury, or not. It ordered in the past the introduction of continuous brakes on passenger trains, a work now practically completed, and sees, in short, that railway companies adopt every precaution of proved value in railway working. How far the care taken by railway officials works for the benefit of the public is well shown in the following extract from a recent speech by Mr. G. J. Mellor, Chairman of the Metropolitan Railway :—

“The total number of passengers conveyed in the United Kingdom in 1901—the figures for 1902 are not yet published

—exclusive of season ticket holders, was 1,172,395,900. The number of passengers killed, for whose deaths the railway companies were responsible, was 135, whilst 2,145 were injured. This means that one passenger was killed out of every 9,000,000 conveyed, or, if we include the season and periodical ticket holders, it would probably be one in every 12,000,000 to 13,000,000 passengers. Why, in the year 1901, in the streets of London alone, there were more persons killed and injured, in vehicular and cycle traffic alone, than on all the railways of the United Kingdom through the default of the railway companies. Thus, whilst railways killed 135, the streets of London traffic killed 186; and whilst railways injured 2,145, London street vehicles injured 9,197. When we consider the vastness and the complexity of the railway system of this country; the gradients, rising or falling, trains have to encounter; the curves they have to round; the slow trains and goods trains which have to be shunted out of the way of the express trains; the stations they have to rush through; the points they have to face; the fogs in winter; the sometimes doubtful lights at roadside stations; . . . I put it to you, is it not a marvel that fatal accidents are so rare, and does it not speak volumes for the capable management of our railway system, the perfect organisation which pervades it, and the splendid discipline which animates the great army of our railway servants, that really serious disasters so seldom occur?"

The number of passengers killed in 1901 on British railways from causes beyond their own control from accidents to trains was *nil*, and on this basis Mr. Mellor's figures are far below the mark.

The interests of railway employees are also carefully watched, and sub-inspectors, selected from the working classes, have been specially appointed with a view to the full carrying out of the provisions deemed necessary

for the safety of railway servants in their arduous and dangerous duties. Needless to say, returns of the most varied character have to be supplied by the companies to keep the Board fully informed as to the manner in which its regulations are complied with. The latest requirements of the Board of Trade were issued under the Railway Employment (Prevention of Accidents) Act of 1900, and related to (1) labelling waggons; (2) movement of waggons by propping and tow-roping; (3) power brakes on engines; (4) lighting of stations or sidings; (5) protection of point-rods, etc.; (6) construction and protection of gauge glasses; (7) arrangement of tool-boxes, etc., on engines; (8) provision of brake vans for trains upon running lines beyond the limits of stations; (9) protection to permanent-way men, when relaying or repairing permanent way. These have been agreed to by the companies, but they are opposing the compulsory use of "either side" brakes, and the Board of Trade authorities have asked for time to enable them to make experiments.

CHAPTER III

RAILWAY ADMINISTRATION

WHILST the warning to British manufacturers and others to "wake up," and bring their methods into line with the more pushing ways of American and German rivals, has undoubtedly had good effects, there is a tendency in some quarters to ignore differences in conditions which often render the complete assimilation of British with foreign trade systems impossible. It is also too often forgotten that one reason why American and German competitors can often beat English makers is to be found in the fact that they have sometimes extended their works far beyond normal market requirements, and in order to dispose of their vast surplus stocks have to sell at prices which leave little or no profit. It is most undesirable that British manufacturers should follow this particular method of competition. The evils of undue extension of works were very clearly brought home to us in the collapse in the iron and steel trades which followed the "boom" in these industries after the Franco-Prussian War.

In the matter of railway facilities there are also

critics who seem unable to grasp the differences of the conditions which prevail in America and in this country. In their Annual Report the Inter-State Commerce Commissioners point out that in the United States at no distant date "the control of most railway properties will be merged in a few individuals," who hold practically the whole of the voting power of the roads, and they draw a gloomy picture of the effects of this state of things on the public welfare. In this country the capital which carries the voting power and control of the policy of the roads is held by thousands of independent proprietors, each of whom has a vote, or votes, in the election of the directors, who appoint the officials and control the policy of their properties. A recent parliamentary return gives the following holdings by investors in fourteen of the leading companies:—

Name of Company.	Total holders.	Deben. holders.	Pref. and Guarant. holders.	Ord. stock holders.
Great Central. . . .	30,035	7,968	15,779	6,288
Average holding . . .	£1,451	£1,677	£1,303	£1,537
Great Eastern	35,020	9,444	16,672	14,079
Average holding . . .	£1,452	£1,844	£1,180	£906
Great Northern	33,049	5,827	16,011	15,696
Average holding . . .	£1,738	£2,478	£1,406	£1,306
Great Western	56,348	12,535	24,696	26,251
Average holding . . .	£1,574	£1,730	£1,511	£1,131
Lancashire and Yorkshire . .	31,013	6,245	16,401	14,591
Average holding . . .	£2,092	£2,947	£1,730	£1,240
London and North Western . .	78,165	14,809	27,007	36,349
Average holding . . .	£1,541	£2,581	£1,458	£1,179
London and South Western . .	26,517	5,328	9,706	13,369
Average holding . . .	£1,776	£2,606	£1,785	£1,188
London, Brighton, and S. Coast .	21,770	3,861	10,056	7,853
Average holding . . .	£1,231	£1,651	£1,096	£1,196
London, Chatham, and Dover.	15,633	5,552	7,339	5,309
Average holding . . .	£1,773	£1,547	£1,073	£2,120

Name of Company.	Total holders.	Deben. holders.	Pref. and Guarant. holders.	Ord. stock holders.
Midland	75,793	13,221	30,792	41,611
Average holding	£2,379	£2,848	£2,180	£1,815
North Eastern	54,012	8,040	17,494	28,478
Average holding	£1,374	£2,841	£1,249	£1,036
South Eastern	17,371	3,642	10,293	7,804
Average holding	£1,720	£2,157	£1,163	£1,272
Caledonian	38,995	5,612	15,820	23,564
Average holding	£1,598	£1,763	£1,182	£1,427
North British	33,841	8,552	25,861	5,224
Average holding	£1,788	£1,871	£1,341	£1,883

In the United States there are five enormous railroad systems, the complete control of which can be placed, for voting purposes, in as many individuals, and obviously a conference of five such magnates can settle in a few minutes questions of the very highest national importance. The London and North Western has twenty-four directors, the Midland fifteen, the North Eastern nineteen, and the Great Western nineteen. These gentlemen are—very wisely—elected, as far as possible, to represent all the great centres from which these companies draw traffic, and they are expected by the shareholders to act on the board with complete independence, and not as mere nominees of their chairmen. The boards are often strengthened by the election of a retiring general manager of long experience. There can be no question that from a national point of view the British system is infinitely superior to the American “one-man” control; though it is equally obvious that movement in the case of a board of, say, twenty independent directors must be vastly more tardy than in the case of a decision to be taken by one individual.

Like so many British institutions, the English system of large boards of railway directors is wrong theoretically, but probably, in the long run, and looked at from something more than a mere shareholders' point of view, it works out the best. Very many railway directors have far larger interests in their own private industries than in the railway they help to govern, and it stands to reason they will not encourage any policy likely to injure the national trade, as might happen in America, where a railway magnate has his entire wealth in his railway, and no stake in the general industries of the country. Here railway shareholders are the public, and the railways cannot adopt an injurious policy without injuring their own proprietors. In the United States the ordinary capital is often held by a few men, who are practically a class by themselves.

The province of a railway board consists of a general direction, or control of policy and finance. The actual administration is in the hands of the permanent officials of a company, who are responsible to the directors as the latter are to the public and to the shareholders for the efficient and economical working of the system. Analogy is to be found in the working of the various Government departments. The Cabinet is answerable to, and removable by, the electorate, but its members must depend for their knowledge of details on the experience of officials trained in the public service. Railways have a similar staff brought up in their employment, and mostly rising step by step to the more responsible posts. Charges of nepotism and undue influence are

doubtless heard of from time to time, but the acknowledged ability of most of the heads of departments proves that on the whole the system in use works well. The number of general managers found worthy of special honour at the hands of the Crown bears testimony to the fitness for office of the leading officials.

With boards of directors selected, as stated, mainly for their large stakes in the industries served by the railway companies, they are of course dependent upon their officials for the technical details of railway working. In the past railway officials in nearly every case rose from the ranks to the highest post available. It is true that in the very early days retired military men were often selected to manage the new undertakings—readers of *Cranford* will recall Captain Brown as a type—but as the business developed, and technical knowledge was absolutely necessary, this system of course gave way to the selection of men who had begun their railway work early and were familiar with the duties required. Men like Sir George Findlay, Sir James Allport, and Mr. Grierson in the past, and Sir Frederick Harrison, the General Manager of the London and North Western, Mr. J. Mathieson, General Manager of the Midland, the late Sir Joseph Wilkinson, of the Great Western, Sir Charles Scotter and Sir C. J. Owens, of the London and South Western, and the large majority of the high officials of to-day, were gradually promoted, and have brought the results of actual experience to their higher work.

To officials of this stamp, thoroughly familiar with

railway working from, in many cases, their boyhood, elaborate theories and statistics possess but few attractions, their reliance being on the constant and active superintendence of their departments, and the appointment of subordinates on whose daily or periodical returns they can thoroughly rely. For a General Manager who at the end of the week has before him returns of the loading of every train run from every station, and who knows the truck requirements and the truck performances from each centre of traffic, figures showing the number of tons of miles moved one mile a month after they have been delivered at their destination are of comparatively little interest.

In the United States much more elaborate statistics are, of course, compiled than in this country, but the conditions of traffic, etc., are absolutely different, and so far as the shareholders are concerned the accounts are presented in such a form as to be often practically—perhaps in the past sometimes purposely—unintelligible. Even in the United States there is much difference of opinion as to the value of these very elaborate figures, and Mr. E. A. Pratt, in his book on American railways just published, points out that

“it is significant, however, that the favourable view is expressed mainly by accounting officers, while the unfavourable view is that of general and district superintendents. In the one case, therefore, one seems to get theory, and in the other practice. Theoretically it is of the highest importance that the railways should have some common form of operating statistics which will enable them to conduct such operations

intelligently and economically; but practically it is declared that the figures in question are not received by the officers responsible for the moving of the traffic until after a delay of from thirty to fifty days; that they take no account of the meteorological conditions prevailing at the time of the movement; that they make no allowance for whether the section to which they refer consists of a gathering ground or a purely intermediate section where through full trains only are dealt with; and that they provide no fair and accurate means of comparing one district with another. So it has happened on one line of railway, at least, that when the accountant, who believed in the statistics, has complained—on their authority—that the earnings per mile were too low, the general freight agent, who doubted their value, has shown that the apparent falling off was due to the increased quantity of grain that was being carried, this grain being, in point of fact, one of the most profitable forms of traffic they had. What might happen is this. A railway company conveying, say for a short distance, a comparatively small consignment of grain for a single local shipper, would be put to a certain amount of trouble and loss of time for which it would have to charge, so that here the earnings per mile would be high; whereas if the same company were asked to take a complete train-load of grain across its system, and had nothing to do but to couple a locomotive to the cars and haul them to their destination, it could afford to accept a low rate, and the earnings per mile would appear to be decidedly low; but the profits in the latter case would be substantially greater than in the former. . . .

“There is a special significance in the fact that a Committee on Statistical Inquiry, which was appointed by the American Railway Association in 1898, and has been more or less active ever since, has recently been enlarged and strengthened for the purpose of making an exhaustive investigation of the subject of railway statistics ‘in order to ascertain

if a better unit than the ton-mile can be devised.' It is understood also that there is no probability of any early report being made by the Committee, 'as the subject is a difficult one to handle.' In the opinion of one very competent authority in the American railway world, who was good enough to discuss this subject with me, ton-mile statistics are incomplete unless they give the figures per commodity as well; and it would seem that the Inter-State Commerce Commission is inclined to require the railway companies to give this further information. The reply, I was told, which the railway companies would probably make to this demand was that they could not give the information, because they had not got it. My authority added that on the system with which he was associated the full figures per ton per mile per commodity were at one time prepared for a series of years, but they were found to be of very little practical value, and their compilation was abandoned when the office room taken up by the ten or fourteen clerks engaged on them was wanted for other purposes. To revive these statistics now would involve the line in question in an expenditure of about \$20,000 a year. On another important line of railway in the United States the company have absolutely declined to yield to the pressure being brought to bear on them by the Inter-State Commerce Commission to publish the cost per ton, the reasons given being: (1) That the figures had necessarily to be based on estimates; (2) that they were averages only, and therefore useless; (3) that as some of the traffic had to be hauled 30 miles and other traffic 1,000 miles, they gave no basis to work upon. There would seem to be still another difficulty which I heard suggested in various quarters—that if the railway companies were to publish the cost of moving commodities per ton per mile, endless trouble would arise with the traders, who would not stop to think that such figures were necessarily exclusive of a variety of standing or other charges, and would

at once seek for reduction in the rates, in the belief that they were paying too much.

“To sum up the situation: Whatever may be the theoretical value of all the elaborate statistics in question, the testimony of a considerable number of general and district superintendents of American railways shows that for the purpose of checking the economical movement of freight they rely on the following statistics as representing what they consider the controlling factors: (1) Car-load, (2) engine-load, (3) earnings per train mile, (4) cost per train mile. So far, therefore, as regards the views and experience of practical officials, there is little or no difference between English and American practice on this much-debated subject.”

The Continental railway accounts are generally at least twelve months behind British figures, and the services rendered to the public are on an entirely different footing to those in this country, where speed of delivery of goods is carried to the highest state of perfection. In India also very elaborate statistics are compiled, but Mr. Robertson, the Special Commissioner for Indian Railways, in a report on their working, compiled after a visit to the United States to inspect the working of railways in the Republic, expresses the opinion that too many and too costly figures are compiled. It has been stated that the one British railway company which prepares ton-mile statistics pays about £5,000 a year for the work done by the department, which means that some £8,000 gross revenue has to be earned to cover the outlay, and the great majority of British railway officials have been unable so far to see results justifying this addition of £8,000 a year to working expenses.

If further experience shows that results proportionate to the outlay are obtained, the officials of other lines will of course have similar statistics compiled. At present they claim that they can secure all the information they require for the economical working of their roads more cheaply and much more expeditiously than through these ton-mile returns. So far as the public are concerned, there is no demand for these statistics—which were compiled by British railway companies in their early days, but discontinued because they were found to be valueless for practical purposes—on the part of the shareholders, apart from a very small section composed of amateur critics of railway administration with time on their hands to play with figures.

One reason put forward for British railway officials adopting ton- and passenger-mile statistics was that by so doing "the General Manager of a railway will possess accurate information of the cost of moving a ton and a passenger, and he will be able to justify to the Railway Commissioners, or to the customers of the company, any rate which may be made after the cost of carrying the individual article has been considered." But such information only gives an average receipt or expenditure per ton-mile, or per passenger-mile—and how can an average figure justify a particular rate? Say the average rate per ton mile is 1'50*d.* This is made up by many varying figures. Perhaps '50*d.* for bricks or stone or manure, and 1'00*d.* for grain and flour; 2'25*d.* for whisky or tea, 3'00*d.* for furniture, and so on. A trader complains of his rate being too high. How can an

average figure, based on innumerable other commodities carried under different conditions, resolve whether it is or not? The manager will know the cost of moving a ton of merchandise, it is said. But this is only an average cost, and the actual cost varies with the nature of the goods, the packing, the quantities in which sent, the distance carried, the cost of terminal services at particular stations, the nature of gradients, and other things. How can an average cost give accurate information regarding a particular rate? A ton rate for merchandise traffic taken "overhead" has in fact no great practical value, inasmuch as no such average rate could be used except for an "overhead" calculation. It does not tell much to say that the average load of a train is forty-four tons unless an idea is given of what the tonnage is composed. The different classes of merchandise traffic vary so much in character, and in the rates chargeable in respect of them, that what would be a paying load of Class 5 merchandise would probably be quite unprofitable in the case of Class 1 traffic, and still more unprofitable in Class C. To give information of practical value in this connection, therefore, the ton-mile receipts should be ascertained in the case of each of the eight classes into which merchandise and mineral traffic is divided, as well as a separate ton-mile rate for live stock.

In a recent case brought by various coalowners against the Scottish railway companies complaining of increases made in the coal rates, it may be mentioned, the railway companies analysed the cost of a train mile

over the whole of one of the systems for one day, and proposed to use general calculations based upon that record as answers to the precise statements made by the coalmasters. While these were being adduced Lord Stormonth Darling objected—"This is the case of an increase six years after the Act of 1894. May it not be said that after that Act fell in view, the companies ought to have been able to lay before this tribunal the best evidence? And the best is certainly not all these elaborate calculations and inferences, which may be subject to an infinity of pitfalls." This was construed to mean that if statistics of ton-mileage cost had been kept for twenty years, his lordship would have accepted them, and they would have proved the companies' case. Lord Cobham, who did not seem to think so, said: "There is yet another test, that of the cost per ton, which, if duly supported by evidence, might perhaps have brought out results more favourable to the companies. So far, however, as I am able to judge from the materials before me, I doubt if this would have been the case."

Difference of opinion has of late years arisen amongst railway officials as to the advisability of separating the commercial from the technical working of the railway. The North Eastern Company introduced this system in January, 1902, but so far only the Great Northern directors have followed the example set, though the officials of a few other lines are understood to approve of the change.

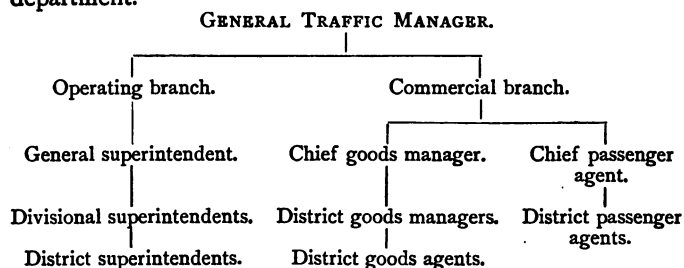
The great advantage claimed for this system is that

it gives the General Manager and the heads of departments more time for thinking of general principles. In making the change the North Eastern authorities explained that

“hitherto the goods department, inheriting a system which originated when railway working problems were less technical and perhaps less important than they have since become, has combined with its commercial work the supervision of the working, and of the staff at goods stations and terminal yards, including the loading and unloading and making up of goods trains, and the distribution of goods waggons. The department of the superintendent of the line has been responsible for the running of goods trains and the operations connected with the working of these trains when in transit, but the functions and authority of the superintendent have not extended within the terminal yards where goods traffic is received for carriage and loaded up, and where really the most vital part of the work affecting the economical handling and working of goods traffic is performed.

“Under the new organisation which is to be adopted by the North Eastern, the superintendent of the line becomes general superintendent with extended authority. The commercial duties connected with passenger and coaching traffic hitherto performed by the superintendent of the line are transferred to a new department under a chief passenger agent. This relieves the general superintendent of a mass of office duties, which tend to withdraw his attention and energies from his main duty of handling and working promptly and economically the traffic which the company have to carry. Similarly, all the duties connected with the working of traffic hitherto performed by the goods department are transferred to the general superintendent, whilst the commercial duties and the office work connected therewith are retained by the goods

department. The general organisation of the traffic departments in the districts will correspond with the organisation at the head offices. The district superintendents, of whom there will be nine, will have complete and undivided control, each in his own district, of all working operations connected with all kinds of traffic—passenger, goods, minerals, docks, etc.—whilst the district goods managers and district passenger agents will, in their respective districts, attend to the commercial part of the work. To assist still further the proper performance of the duties assigned to the department of the general superintendent, upon which the economical working of the railway so greatly depends, three new posts are created—namely, those of divisional superintendents, in one of which is merged an existing office of mineral manager in one district. These officers will each have charge of one section of the entire system, and will, under the general superintendent, exercise supervision by constant inspection over all the work of the district superintendents. The general scheme of the new organisation is shown on the following chart, and a list of the officers appointed to the various posts is also given below; also the official allocation of the duties of each department.



For the old system, which is still maintained on most railways in this country, it is claimed that the changes introduced by the North Eastern consist merely of the

shifting of work and responsibility from one department to another. Under the old system the superintendent of the line is responsible for the working of all trains—passenger, goods, minerals, and cattle—as well as for all matters relating to passengers, parcels, and other business coming under the head of “coaching” traffic. The chief goods manager, on the other hand, has the entire control of everything affecting goods and mineral traffic, including the working of goods stations, yards, docks, etc. These two officers are, of course, assisted by a number of capable men, each taking the head of a department or section, and supervising the work performed by the district goods managers, district superintendents, agents, and stationmasters.

The division into an operating and a commercial branch means, it is contended, that the goods department is relieved of the control of their stations, warehouses, yards, and docks, and of the loading, unloading, and handling of the goods traffic, the whole of which work is transferred to the general superintendent's department, which, on the other hand, is only relieved to a comparatively small extent by certain duties, chiefly advertising and canvassing, being placed under the charge of a chief and district passenger agent. The work and responsibility thus taken away from the superintendent's department cannot in any way, it is urged, compare with the amount and importance of the goods work, which is transferred from the control of the chief goods manager to that of the general superintendent. The working of the line, including all

running lines, marshalling sidings, etc., is of such importance that it is regarded as a retrograde movement to hamper the superintendent's department with the additional responsibility entailed by the supervision of all the goods sheds, warehouses, yards, sidings, and docks, and the handling of all goods traffic. The chief goods manager continues to be responsible for the securing and development of the goods and mineral traffic of the line, and the control of the necessary accommodation, appliances, and staff required to work it to the best advantage.

The idea of the new system is to centralise the whole of the practical working under the one department, but as the cartage of goods and parcels traffic is performed by the chief goods manager's and chief passenger agent's departments, the object which is aimed at is not, it is contended, entirely secured. There are also many points in which the two departments really deal with the same matters, or with different sections of the same subject. The general superintendent's department, for instance, prepare all time-tables and bills, notices and instructions, whereas the chief passenger agent prepares, distributes, and issues all other advertisements in relation to coaching traffic, and also distributes and issues to the public the time-tables prepared by the general superintendent. Again, the general superintendent's department examines and reports on all applications from traders in connection with private sidings, while the goods department do the same in regard to questions of rates and charges.

Dealing with the various posts, new positions are created to carry out the changed system. In the operating branch, the general superintendent is assisted by an assistant superintendent and three divisional superintendents, to supervise the nine district superintendents. It is, it is urged, difficult to see that there is any new departure here, seeing that all the other large companies have several assistants to the superintendent of the line, some working in their own names, others under that of the head of the department. In the goods department, the chief goods manager has nobody between him and the district goods managers except his assistant, but with decreased responsibility and less important duties the numerous headquarters officers attached to the chief goods manager's department, who are necessary on other railways, are, of course, not required at York. The officers naturally follow the work from the goods manager's department to the superintendent's department. The goods manager's department, in fact, is almost confined to the performance of duties similar to those which have in the past been performed by carting agents, thus creating, it is contended, the delays, the dual authority, the departmental friction, and the unnecessary duplication of work which it has for years been the aim of the other large railway companies to abolish.

The new system introduced by the North Eastern will, of course, be carefully watched by the officials of other lines. The unique position of the company in having very large districts without competition from

other railways places it in an exceptionally favourable position for trying such experiments.

It may also be mentioned that the Midland Company recently reorganised their administrative system on lines similar to those in force in the London and North Western service. This took the form of decentralisation, in connection with which a number of district goods managers were appointed—district superintendents had been previously appointed—upon whom devolve a considerable part of the work previously carried on in the chief goods manager's department at Derby. The chief advantage of the new system is that it relieves the Derby offices of a large amount of work, leaving the chief goods manager and his staff to deal with matters of what may be termed imperial interest ; and it affords training grounds for providing efficient and experienced officers to take their part in the chief management.

PASSENGER AND GOODS SERVICES

The matter of increasing expenditure has for some years past been receiving the attention of railway boards and managers, who have also been favoured, somewhat late in the day, with the advice, valuable and otherwise, of amateur critics in the press. These writers have chiefly urged the adoption of "American" methods, incited thereto by the extraordinary development of commercial and industrial prosperity in the United States, in which the railroads of the country have shared. Broadly speaking, the problem to be solved for the reduction of ordinary working expenditure

consists in the increase of the paying load of trains and the proportionate addition to haulage power. The questions involved form the very first elements of railway management. An ideal state of affairs for shareholders would be that no train should be despatched until every seat was occupied, and every waggon filled to its utmost capacity. From the public point of view every traveller and trader would, on the other hand, prefer that a train should be ready at any hour of the day or night to convey himself, or his goods, to the destination. To reconcile or to find the just medium between these extreme requirements is the main question involved in successful railway management, and it is obvious that the solution will vary according to the circumstances of the community and of the traffic.

America is a country of long distances, and requiring the conveyance of heavy products in large consignments, these being conditions of wholesale business. Compared with the huge bulk of traffic to be conveyed, say, from Chicago a thousand miles to the seaboard, the haulage of goods on this side of the Atlantic represents retail trade, but requires no less organisation and care to meet the circumstances of the case.

With reference to the types of rolling stock in use in the two countries, the following practical remarks are from the able report by Lieutenant-Colonel H. A. Yorke, R.E., the Board of Trade chief inspecting officer of railways, on the results of a visit to study American railway methods:—

“Probably the feature of American railways, which at first

sight makes the most impression on a stranger, is the colossal size of the engines and cars employed thereon, and to this is due much of the correspondence which at intervals fills the columns of the papers concerning American methods of handling traffic. There is no doubt that the engines are very big, some of them standing 16 feet high above rail-level, and many more of them 14 feet 6 inches and 15 feet. Such engines have great power, and are able to haul trains of great weight and length. In the early days of American railroads overbridges and tunnels were almost unknown, and now that such are being constructed they have to accommodate themselves to the rolling stock, instead of the rolling stock to the bridges, as in England. In America overbridges are built 18 feet above rail-level, whereas in England the height of such works is as a rule only 14 feet 3 inches above the rails. Moreover, on double lines in the States the space between the tracks is 7 feet, against 6 feet in England. It can, therefore, be understood that what is possible in the one country is impossible in the other, and we can never hope in England to equal America in the size of our engines or cars."

It may be useful also to point out that in the United States the opinion is gaining ground that there are offsets to the advantages of these gigantic engines, which have, of course, been built to suit conditions with no counterpart in this country. Thus, the *Chicago Railway Age* says :—

"Evidence is accumulating which tends to show that the locomotive has grown too rapidly, and that, as now constructed, on many lines where it is employed, it is not well adapted to the service. If its record could be written up, showing the time it is out of service and the expense it has already caused for repairs, it would be appalling to conservative railroad managers and at least discouraging to the more

progressive. The difficulty with leaky tubes on new engines with medium wide fire-boxes is quite general, and as the cause is not well understood, a certain remedy cannot, therefore, be applied. Under such conditions the engine cannot develop its full capacity, and it is under the disadvantages of being compelled to propel its own extra great dead weight with its tractive power lessened. The enginemmen are demanding more wages for handling the big power, and the firemen complain that the amount of coal burned is so large that two firemen should be employed. The accumulation of condensed steam in large cylinders of compound engines and the compression of gases demand numerous relief valves. These are constantly leaking and surrounding the front of the engine with a cloud which must be annoying to the engine-man, and often dangerous on account of his inability to see the signals. These three conditions seriously affect the usefulness of the large engine when in service. The records show numerous breakages which throw it out of service completely. Some of these are due to faulty design and others to a want of proper adaptation to surrounding conditions. . . . The lesson to be learned from the failure of heavy locomotives in such large numbers is that these machines cannot be constructed with certainty of success by our best builders, with their magnificent shops and skilful designers, and that they must be developed gradually by a process of continued improvement, due to the knowledge gained by their various failures in detail in service. All this requires time, and a longer time than has been given to the development of the very large locomotive."

For railway shareholders and all but a few very superior critics of railway administration, the views above quoted will be sufficient proof that British railway officials have not been hopelessly neglecting their duty

because they have not introduced engines of the same size as those used in America, but have been content to develop gradually the types found suitable for traffic in this country. That there has, during the last ten years, been a steady increase in the weight and hauling capacity of British locomotives, is so well known that detailed proof need not be given. This increase has not been due to a sudden impetus given to locomotive superintendents by outside pressure, but has moved on normal lines, and as a result of a clear understanding of what the developments of the companies' business required. There has been no lack of keen rivalry amongst locomotive superintendents to turn out the very best engines suitable for the traffic conditions of their systems, but it may be worth considering whether the time has not arrived for more combined action in future developments than has been possible, or desirable, in the past.

As long ago as 1895, the London and North Western Company commenced to build eight-wheeled three-cylinder compound engines capable of hauling fully loaded trains over the heavy gradients on the system with one instead of two engines. Between 1895 and 1900 the Company built 111 of these engines, and in the latter year eight-wheeled four-cylinder compound engines were commenced capable of hauling 50 to 60 (according to gradient) loaded mineral waggons against 35 to 40 taken by the old class of engine, or an increase of 40 to 50 per cent. To date some 70 of these engines have been put into traffic working, and have

largely contributed to the saving of close upon 2,000,000 of train miles in the past two years. The Midland Company have now passenger engines running over the Company's difficult gradients, at high speeds, drawing longer trains and heavier loads than would at one time have been thought possible. On this railway the average express passenger loading per train for first-class engines, compared with what it was five years ago, shows an increase of about 35 per cent. in the number, and 54 per cent. increase in the weight of the coaches hauled. In 1899 the mineral and goods loading was increased by 10 per cent., and later the goods loading on a number of sections of the line by a further 8 per cent., while the most recently turned out engines are taking mineral 25 per cent., and goods to a maximum of 36 per cent. more loading than five years ago.

As indicating that British railway directors and officials are not too proud to learn from foreign experience, the Great Western Company are trying a French compound engine. This experiment is, of course, no slight on the Swindon authorities, who have increased the hauling power of the Company's engines employed on heavy mineral traffic something like 50 per cent. within the last few years, and thereby effected a very considerable saving of mileage. As a provision also for dealing with heavier fast passenger traffic in the future over their severe gradients, they are putting into service very powerful six-wheeled coupled express locomotives, capable of drawing very much greater loads than the present types of engines in use. Very favourable

results have also been obtained on the Lancashire and Yorkshire system from the heavier engines introduced in recent years. In 1898 a larger type of passenger engine, with cylinders 19 inches in diameter and 26 inches stroke, working with a boiler pressure of 180 lbs. per square inch of heating furnace, tubes and fire-box 2,052 square feet, and grate area of $26\frac{1}{2}$ square feet, was introduced to cope with the heavier and faster trains; 40 engines of this class are now running, and are giving every satisfaction. In April, 1900, the first of a number of eight-wheeled coupled goods engines with large boiler, 180 lbs. working pressure, cylinders 20 inches in diameter by 26 inches stroke, was put into service. These engines haul 50 per cent. more weight than the six-wheeled coupled goods engines previously used. Trains of 1,000 tons are now being hauled over certain sections of the line; as a matter of fact, fewer goods train miles are being run per day than four years ago, although the tons hauled have increased over 720,000 per annum compared with four years ago. By the end of the current year 80 of this class will be at work.

As regards the Great Northern, the chairman told the shareholders as long ago as February, 1900, that their locomotive engineer was busily engaged in turning out heavier engines, and in the following year he announced that no more of the small engines were being built, and as they died out they would be replaced by engines which would pull at least 30 per cent. more weight. The result of this policy Lord Allerton set forth in the most striking manner at the last half-yearly meeting,

when he pointed out that, compared with 1899, the gross engine miles for 1902 showed a decrease of no less than 2,117,000 miles, and the train miles a reduction of 1,341,659 miles, notwithstanding an increase in gross earnings of £206,560.

The Great Eastern Company, again, during the past four years have built 80 locomotives of a powerful type, and at the recent meeting the chairman said the directors were, of course, fully alive to the vast importance of continuing to increase the haulage power of all new engines. Owing to these more powerful engines, the Company were able last half to haul coal trains of 50 instead of 40 trucks, of a total weight of 750 tons behind the engine. So strongly do the directors of this Company feel the advantage of powerful locomotives for passenger and other traffic, that they have decided to replace old bridges by structures capable of bearing 20 tons on a pair of driving wheels at a cost of £78,000, and it will be money well expended. This Company has also done good work with oil as fuel, and has recently turned out the interesting "decapod" engine.

The North Eastern Company have, during the last ten years, added very powerful engines to their stock, and are now building locomotives for their express services with boilers 16 feet $2\frac{1}{2}$ inches long and 5 feet 6 inches in diameter.

On the southern lines excellent work has been done. On the Brighton the increase in the size of the goods and express locomotives—a large amount of this Com-

pany's work is done by tank engines—has been very marked, and the latest design of the latter, of which there are 33 at work, weighs 77 tons 7 cwt. in working order. One of these can haul a load equal to 31 six-wheel coaches, that is to say, a weight of 375 tons, from Brighton to London express on schedule time. The South Eastern and Chatham Company have added a large number of very fine engines to their stock, and more are coming ; while on the South Western the engines are to a large extent ahead of the loads offering.

In Scotland good work has been done in the locomotive department. Ten-wheel express engines, having 5 feet 9 inch driving wheels and 2,050 square feet of heating surface, were introduced some little time back on the Highland system, and the Caledonian has just turned out two locomotives of the same type, with six wheels coupled, each of which is 6 feet 6 inches diameter, and the boilers have 2,400 square feet of heating surface. These Caledonian engines weigh 72 tons, and the tender is carried on two four-wheeled bogies, and has a fuel space for 6 tons and a capacity for 5,000 gallons of water. The North British Company also have been gradually increasing the size of their locomotives, and are at present building several engines which are considerably larger than any hitherto in use ; one or two have, in fact, already been turned out, and their trial runs proved most successful.

Without multiplying instances of the progress in locomotive construction in the past ten years, it may be broadly stated that for some time past on the lead-

ing roads every engine broken up has been replaced by a more powerful one.

As regards passenger vehicles, the types in use in this country are, on the whole, best suited to British tastes. The one desire of the ordinary passenger is to get a compartment to himself, and the corridor type seems the best compromise between this national trait and the demand, which always arises after some striking crime in a railway carriage, for possible intercommunication between the sections. The old-fashioned footwarmer is, moreover, preferred by a very large section of the public to heating by steam or other systems, although the latter is getting more and more common. There has been a very great all-round improvement in recent years in the lighting of railway carriages, the system of generating electricity by the revolution of the axles while the train is running coming into increasing favour, although the initial cost is heavy compared with the figures of other methods. It may be added that practically the whole of the coaching stock of the United Kingdom is now fitted with continuous brakes.

Turning to the waggons in use for goods and minerals, the questions involved are, of course, more complicated than those which arise in connection with coaching stock. In considering these questions it must be remembered that in this country a very large proportion of the waggons used are owned by the traders—a relic of the days when it was thought that the companies would simply build the railways, and everyone would have the right to use them on payment of

proper tolls. In any attempts to make wide changes in the construction of waggons this dual ownership is of course an important point. The specifications of waggons to be used are settled by meetings of all the railway companies at the Railway Clearing House, the usual types adopted running from 5 to 10 tons. Following upon the careful inquiries which railway officials have been for many years carrying on, the standard waggon specifications were in January, 1903, enlarged, so that private waggon owners may build vehicles of 15 and 20 tons capacity, instead of being restricted, as heretofore, to waggons of a capacity of 10 tons.

British railway companies have of course for years past used large waggons, some capable of carrying 40 tons, for special purposes. They carry boilers, rails, and goods of that kind. The Great Western Railway Company have also long had 20-ton trucks for locomotive coal, and use them for ballasting the line; but the broad and common-sense principle is that until you can fill a 10-ton truck with a reasonable load it is hardly worth while to drag about a 20-ton truck. What the public require for merchandise is quick transport of light loads; they will not be kept waiting to fill up a 20-ton truck.

As indicating how unsuitable 30-ton trucks are for ordinary goods traffic on British railways, it may be mentioned that on the Great Northern an analysis of the general goods traffic dealt with at one station in one day showed the total number of consignments was 985 ;

the total number of packages was 4,427; the total weight was 123 tons 2 cwt. 2 qrs.; the average weight per consignment was 2 cwt.; the average weight per package was 62 lbs.; the total number of trucks used was 72; and the number of different destinations of that traffic was 53, and the average load per truck 34 cwt.

A similar analysis made at a London and North Western station in one day showed the total number of consignments despatched was 6,201, the total number of packages 23,067, and the total weight 906 tons, giving an average weight per consignment of 2 cwt. 3 qrs. 19 lbs., and per package of 88 lbs. The London and North Western Company's system of loading small lots to their transship shed at Crewe enables them to effect large economies in the number of trucks used, but even under these favourable circumstances 379 waggons were required for the 720 different destinations, and an average of only 2 tons 7 cwt. 3 qrs. per waggon was attained.

In the case of grain the average consignment of traffic is nearer 2 tons than 6 tons, notwithstanding that considerably lower rates are offered for consignments of 4 or 6 tons respectively. One of the English railway companies recently issued a list of special rates for agricultural traffic in 6-ton loads on an exceptionally low basis, and offered to allow the loads to be made up of several different descriptions of merchandise. This was done with the double view of assisting the farmer and of securing full loads for the trucks, but the experiment was practically a failure, as there was very little

response on the part of the farmer or the trader. With 53 different destinations for 123 tons of goods in the case of the Great Northern, and 720 destinations for 906 tons in the case of the London and North Western, what would be the use of 30-ton waggons?

On the southern lines the field for the useful employment of high-capacity waggons for goods traffic is, of course, even more limited than on the northern systems. On the South Eastern and Chatham system, for instance, the average consignment of general goods from London is under 5 tons, and the average consignment from the country is under 3 tons, while the maximum from the country is $4\frac{1}{2}$ tons of general merchandise. The Brighton Company cannot show a longer average haul than 20 miles, and the average load per waggon does not exceed 2 tons, and the main goods business is of a market-garden nature, in which celerity of delivery is of prime importance, goods collected in the evening being wanted by the consignee next morning.

Whilst high-capacity waggons are quite unsuitable for the general goods traffic of this country, however useful they may be for traffic in the United States, there is equally obviously room for larger waggons in the mineral department, and this fact was equally known to British railway officials long before the recent agitation against British railway methods. For years past the London and North Western Company have been trying to introduce larger waggons, and some 112 20-ton waggons have been working for three years past,

while the number of this type is now increased to 143; but it is only under certain conditions that they can be used. The locomotive department built 62 of them, but, at present, the appliances at the various collieries only permit of these waggons being loaded in a few instances, and the problem which still has to be solved is how to build larger waggons, which will be suitable for all or most of the collieries, at the lowest possible cost. It must be borne in mind that the bulk of the traffic is carried in waggons owned by the traders, so that the railway companies have not got the matter in their own hands, but have to act in concert with their customers. With the Company's heavy coal traffic the average consignment is only $17\frac{1}{2}$ tons, and the consignments vary from lots of only 2 tons 14 cwt. (the lowest) to close upon 1,000 tons for shipment. Taking it another way: over 80 per cent. of the consignments of coal traffic received are of less than 20 tons.

There are very few places on the Midland Railway where a 30-ton waggon can be used to advantage, but the Company have at present running 50 of these 30-ton waggons. They do very well, but they are not at all an unmixed blessing, for they knock their smaller neighbours about heavily in shunting operations. The Lancashire and Yorkshire Company have built 30-ton waggons, and, so far as it is possible to obtain full loads for these waggons, they have, of course, been of considerable use. From one of the Company's ports the average loading works out to over 24 tons per waggon, while in other cases, where the traffic is bulky rather

than heavy, the average loading is about 16 tons, though the waggons are used to their full capacity.

The North Eastern Company, which is successfully using several trains of 40-ton trucks for mineral traffic, is in several ways exceptionally fortunately placed for this class of work. In the first place, under its Act it supplies all the waggons for its customers, and has thus no private waggon stock to deal with. Then, too, a very large percentage of its mineral traffic is run entirely over its own lines direct from the pits to its own docks, over the arrangements at which it has, of course, complete control. Mr. G. S. Gibb, the General Manager of the line, has recently said large waggons could not profitably be used for some kinds of traffic, but for a large proportion they were far better and more suitable than the small 7-, 8-, or 10-ton waggons, which had been in general use. The 40-ton waggons on the North Eastern line were, he added, splendid waggons, where they could be used, much superior from the point of view of mechanics and dynamics to the smaller waggons, but they were not suitable for universal use. They could be profitably used in many places and for certain descriptions of general traffic; but the mineral waggon which the North Eastern Railway Company were building for general use—of course, to be gradually introduced as traders found, as he had no doubt they would find, the benefit of using these waggons—was a 20-ton waggon on four wheels.

In Scotland the officials have been prepared to meet the requirements of the coal trade, and Sir James

Thompson, the chairman of the Caledonian Railway, said at the last half-yearly meeting: "We have been for some time back feeling our way cautiously by the introduction of large-capacity waggons, which are, no doubt, well suited only for certain classes of traffic; and wherever it is clear that large waggons are more economical than small ones, you may rely on their introduction on the Caledonian system; of course, this is a process that must be gradual, and also accomplished by the co-operation of the traders." This Company has placed orders for 1,000 waggons of 12 to 16 tons, and for fifty of 30 tons capacity. The North British Railway Company have recently increased their stock of mineral and goods waggons by introducing a considerable number of an increased carrying capacity. Over 500 of 16-ton carrying capacity have already been built, and this number is being added to every week. They are 15 feet long, with a tare weight of 6 tons 14 cwt. The directors of the Glasgow and South Western Company, having regard to the facilities and appliances at the pits and at the ports, have come to the conclusion that waggons of 16 tons capacity for ore are the largest they can advantageously bring into use at the present time. To employ waggons of this capacity it will be necessary for the screens at a number of the pits to be altered, and some of the coalmasters have expressed their willingness to make the necessary alterations to admit of such waggons being used. Waggons of 30 tons capacity are unsuitable for the traffic on this line, which is short-distance traffic to the

extent of fully 75 per cent., and as two 16-ton waggons exceed in capacity that of the 30-ton truck, whilst the tare is proportionately the same, no gain is secured by the adoption of the latter; on the contrary, the smaller waggons being suitable for the traffic requirements, generally offer advantages which the others do not. The question of cost also has to be considered, and two 16-ton waggons entail a considerably lesser expenditure than one 30-ton bogie waggon.

The question of providing for 30- and 40-ton waggons was not in the minds of engineers when British railways were constructed, except where extensions have been made or new lines opened up within the last few years, and this fact has to be remembered in recommending the use of these big trucks on any particular system.

As regards large waggons of the American type, Colonel Yorke, in his report on the railways of the United States, points out :—

“A great deal has recently been said about the long freight cars used in America, and English railway managers have been criticised for not adopting cars of equal dimensions in this country. I think some misapprehension occasionally arises on the subject. The important factor in the case is not the length of the car, but the carrying capacity of the car in relation to its weight. American freight cars are all carried on bogies, and as a rule there are eight wheels to a car. Their carrying capacity varies from 30 to 50 tons, and their tare weight from 15 to 20 tons. One of the most popular forms of car at the present time appears to be the 50-foot steel-framed car, with a capacity of 50 tons (of 2,000 lbs.) and a tare of about 20 tons, the total weight per axle being 17 tons 10 cwt. So long as these pro-

portions are adhered to it makes no difference, so far as the cost of transportation is concerned, whether the load is carried in one car with eight wheels or in two cars with four wheels each. That is to say, the result will be the same if, instead of one car of the size and weight mentioned, two cars are employed, each with a capacity of 25 tons and a tare of 10 tons, and each having four wheels. Not all the cars in America offer such favourable conditions as those just mentioned. The box cars have, as a rule, a carrying capacity of 30 to 40 tons and a tare of 16 to 18 tons, the paying load in these cases having a less proportion to the dead load than is the case with the 50-ton cars.

“There are serious difficulties in the way of introducing, for general service in England, waggons of great length. The sidings, goods sheds, weigh bridges, turn tables, coal tips, screens, etc., are, as a rule, quite unsuitable for waggons of the dimensions named, to say nothing of the usual conditions of trade, which are based on the present style of vehicle. It is sometimes suggested that English companies should forthwith reconstruct the whole of these works and appliances, but no one has as yet estimated what the cost of such alterations would amount to. It is probably incalculable, and the question arises, whether, after all this vast expenditure had been incurred, and the whole trade of the country had been disorganised during the transition period, the saving in handling the traffic would pay the interest on the outlay. The four-wheeled waggon will, therefore, in all probability, remain the standard waggon of the country, and economy is to be sought in improving the design of such waggons, and increasing their carrying capacity in relation to their tare, rather than in introducing waggons of greater length.”

In the direction indicated by Colonel Yorke, British railway officials are steadily working, and for the sake



of uniformity and to bring about their universal use, some of the companies are trying to get a standard waggon of, say, 15 tons capacity adopted by the coal trade. The views of the colliery owners were recently stated before the Coal Commission now sitting, by Mr. Joseph Shaw, chairman of the Powell-Dyffryn Steam Coal Company, who said the size of coal waggons ought to be increased, but the increase should be gradual, so as not to upset existing trade conditions.

As regards the relative advantages of 20- and 30-ton trucks, the following comparison is useful:—The four-wheeled North Western waggon, carrying 20 tons, gives load per axle, 5 tons; tare per axle, 1.97 tons; gross load, 6.97; efficiency, 71 per cent. of the gross. On the other hand, for a 30-ton “bogie” waggon on eight wheels the corresponding figures are: Paying load per axle, 3.75 tons; tare, 1.725 tons; gross load, 5.475 tons, giving an efficiency of only 67 per cent. of the gross. But many of the companies are now, as stated, experimenting with 15-, 20-, 30-, and 40-ton waggons, and as many as can be profitably used will be in the future employed, while some of the private owners are also seconding the railway companies’ efforts in this direction.

In the course of a recent series of articles in the *Times* on the methods of working in America and this country, the writer says:—

“While in the general handling of passenger business the greatest differences may exist between American and British practices, the advantages are, in many instances, on our own side; and where they are in favour of the American system it

is mostly because there are conditions to be met and provided for which are not to be found in Great Britain. In regard to freight, no one can for a single moment doubt that with the great quantities of produce or merchandise they secure, and carry for distances so vast, the American lines have been able to effect great economies in their operating expenses by reducing the cost of handling, especially through the construction of their larger locomotives and waggons. Yet here again it by no means follows that what can be done, and done with undeniable success, in the United States, would be equally capable of application in our own country. I have shown, too, that while, in some respects, the American railways—thanks to the circumstances in which they are able to operate—may claim to be in advance of us, in other respects they are distinctly behind us; and on this point I came across striking evidence in a final look round in New York on returning from my travels across the country; for in Eleventh Avenue I noticed that the whole of the traffic of that busy thoroughfare passed directly over no fewer than twenty-five sets of rails, representing what was virtually the shunting yard of the New York Central and Hudson River Railroad. It occurred to me that if some of the more eager advocates of the adoption of American railway methods in England were to visit this spot, they would speedily change their opinions as to the superiority of those methods over our own. What there is to be gained from American experience the British railways are evidently ready enough to learn; for, as I write these lines in my hotel in New York, I hear of the arrival in the city of a deputation of ten prominent officials of the London and North Western and Caledonian Railways on one of those periodical missions of inquiry to the United States such as American railway managers, in their turn, send to Great Britain when they wish to learn more about English methods of railway business, especially in regard to passenger traffic.

“As for my own verdict on the subject of American railways, it is, in effect, the same as that which was pronounced in regard to British railways by an American railway official who was sent to Great Britain to study our own system, and who, on being asked to give his unbiassed judgment thereon, replied: ‘British methods are well adapted to meet British conditions, just as American methods are well adapted to meet American conditions, and there is very little for either country to learn from the other.’”

With regard to long-distance travel, it may be well to recall that the London and North Western Railway has recently repeated the performance of August, 1895, viz. running to and from Carlisle without a stop; the Great Western have done similar runs to Plymouth, and the Brighton officials have taken a train from Victoria to Brighton in forty-eight minutes. These and other runs have shown that, when necessary, British trains can equal, or excel, any world's records. The point is, however, what is the practical advantage of these extraordinary efforts? In this country the distances to be covered are so comparatively short that normal performances are quite sufficient to satisfy 999 out of every 1000 passengers. The remaining one—an enthusiast for breaking records—overlooks the important element of the cost of increasing speed, on which point it may be useful to quote some facts collected by Mr. Delano, of the Western Railway Club of the United States, and worked into a paper read at Chicago.

Mr. Delano recounts six different sources of extra expenditure due to high speeds. The first of these is

increased fuel consumption ; the second is the necessity for better and more expensive rolling stock ; the third is increased wear and tear ; the fourth, increased risk of accident by failure of the engine or coaches on permanent way ; the fifth, augmented risk of collisions ; and lastly, the delay to traffic entailed by keeping the road clear for high-speed trains. It appears from the discussion which took place on the reading of Mr. Delano's paper, that the extra fuel cost is the result, not only of the larger quantity burned, but of the trouble entailed in selecting the best possible coal, without which the engines cannot keep time. Thus, Mr. Henderson, of the Chicago and North Western line, stated that the coal for the fast trains had to be hand-picked to get rid of slates or rubbish, and carefully screened to get rid of slack ; and he added that a further source of expenditure lay in the extravagant consumption of oil, not only on the engines, but on all the coaches. No attempt has been made to dispute that there is much extra wear and tear. Where accurate records are kept, it is "found that the failures in passenger service are much greater in relation to the train haulage than the failures in freight service." Mr. Delano holds, not unnaturally, that the consequences of an accident are certain to be much more serious, both in money loss and moral effect, at high than at low speeds.

Leaving, however, what may be regarded as fortuitous events, we come to a source of steady outlay, which appears to be, on the whole, much more important. It has long been held by those who have the control of

railways that the best way to get a maximum amount of work out of the road is to have all the trains on it at any one time moving at, as nearly as may be, a uniform speed.

Mr. Delano, writing on the point, says: "A steam road handling long trains at intervals which are determined by the speed of the intermediate slow trains, cannot begin to do the business which is done by a slow-moving street-car line, or elevated railroad with its frequent trains. The slow train may either follow the fast train, or a fast train follow a slow one. In either case there is a gap behind or before the slow train, during which time the railroad is unoccupied and earning no money." A careful estimate made of the cost of running ordinary passenger trains in the United States gives about one dollar per mile. The cost of the limited trains is given at about two dollars per mile.

Although, of course, American railways do some magnificent runs, it can be safely asserted that the services given by the British lines are on the whole, and for the general public, far superior to those to be found in the United States. The public here would not, indeed, stand for a week what travellers and traders in America have to put up with. It is not "beating the record" with one or two specially favoured expresses that is alone required, but a careful consideration of the wants of all classes of the community. What can any reasonable being require more than the express services of the London and North Western Railway, say, between



London and Glasgow, Liverpool, Manchester, and Birmingham? Between London and Birmingham, a distance of 113 miles, there are nineteen down and seventeen up trains, some with breakfast and dining-cars, the fastest time being two hours. To and from Liverpool and Manchester there are from thirteen to seventeen services with London, the fastest trains taking $3\frac{1}{4}$ hours for the 183½ miles separating the metropolis from Manchester, and 3 hours 55 minutes for the journey of 201 miles with Liverpool. Again, the 401 miles between Euston and Glasgow are covered in $8\frac{1}{2}$ hours, there being eight trains a day for the down and seven for the up journey.

The express goods services of this Company are also infinitely superior to anything abroad. Goods from London to places such as Liverpool, Manchester, Chester, Sheffield, Leeds, without counting shorter distances, such as Leicester, Birmingham, Wolverhampton, etc., are all delivered on the morning after despatch, with a similar service in the reverse direction; while cross-country traffic, such as Burton to Swansea, and Cambridge to Shrewsbury, is dealt with equally promptly. Then, again, the one day's goods service between London, Birmingham, etc., and Glasgow, Edinburgh, Perth, and Dublin, including the sea passage between that port and Holyhead, is a long-established fact, the London and North Western Company having been the pioneers of the one day's service between England and Scotland and Ireland.

THE RAILWAY ASSOCIATION AND THE RAILWAY
CLEARING HOUSE

A weak point in the British railway position in the past has been the absence of a strong central committee to guide and represent this great industry as a whole. Of late years, however, the Railway Association has been strengthened and the body made far more representative than it was in former days. Forty-three companies are members, and each elects a delegate or delegates to attend meetings which may be called at any time, and especially to take action with respect to any Bill in Parliament affecting the general interests. It seems very desirable that every railway director and official should do his best to make this central authority a thoroughly strong and representative body. Obviously at its deliberations differences of opinion must arise, but these should be minimised for the benefit of the general interests concerned.

Many of the persons who speak and write so glibly respecting the management of the railways of the country might find some instructive, and perhaps profitable, employment in making themselves acquainted with what may be termed the inner life and working of our railway system. A visit to the Railway Clearing House, for instance, would, if we are not greatly mistaken, serve to mitigate that feeling of overweening confidence in their own ability and in their qualifications for the work which they are prepared forthwith to undertake. Probably, of all the popular

delusions of the day, there is not one which is more generally indulged in than that of the simplicity of railway working and management, and the ease and readiness with which improvement in the present system could be effected. Few indeed can realise what is involved in the task of running a year's trains over 398 millions of miles, carrying 1,172 millions of passengers and 416 millions of tons of goods and minerals. It is for the purpose of adjusting and apportioning the many millions of claims arising between the companies in the conduct of this enormous business that the Railway Clearing House exists. This system is not one which was invented for railway companies. It was adopted by them, but it has reached dimensions which at the time of its establishment could never have been anticipated. Before railways existed, and in the old coaching days, there was a clearing house of the proprietors of the stage coaches. It had its headquarters at the "Golden Cross," Charing Cross, and the managers had to arrange among themselves the amounts due to the respective proprietors who owned or horsed the vehicles which were employed on any journey. A passenger or a parcel, for instance, booked from London to Holyhead, would in the course of his journey be conveyed by coaches owned by at least a dozen different proprietors, and to each of these was allotted that portion of the fare which fell to his lot according to the mileage which he had provided. The amount received for the carriage of His Majesty's mails formed a portion of the common fund, which was divided among those who

took their share in the carriage of the mails. The amount to be divided did not assume very formidable dimensions when, as Sir Walter Scott records in a note to *Red Gauntlet*, the London post was brought to Edinburgh in a small mail-cart, and there were men then living who recollected when the mail-cart came down with one letter only, and that addressed to the British Linen Company.

When railways began to extend and ramify over the country, and traffic began to be exchanged from one to the other, it soon became evident that the "clearing" system analogous to that of the old coaching days must be adopted. When the railway had reached Rugby and Birmingham, connections were made with the Midland Counties, North Midland, Birmingham, Derby, and other lines. If a system of through booking from London were to be adopted, some central or recognised association in which all parties interested would have confidence must be created to appropriate the portion due to each company in respect of the work to be done. So it came to pass that in January, 1842, the Railway Clearing House was established, Mr. Carr Glyn, then Chairman of the London and North Western, Mr. Robert Stephenson, and Mr. Morison being the first founders of the Association.

Without arrangements similar to those provided by the Clearing House, it would be impossible for passengers to travel from one place to another except upon the line owned by one company, without incurring delays and inconvenience which would be caused by the change of carriage; or, in the case of goods, the

transshipment from the trucks of one company to another. Mr. Kenneth Morison, auditor of the London and Birmingham line, was the first to see the necessity of establishing a clearing house system on principles similar to those adopted by the London banking houses. His plan was submitted to Mr. Robert Stephenson, the engineer, and to Mr. Carr Glyn, then Chairman of the Company. George Hudson, "the Railway King," gave to the scheme his hearty support, and Mr. Creed, the Secretary, and Captain Laws further developed the idea, and suggested modes by which anticipated difficulties in carrying it out could be overcome. Finally, all preliminary objections were got over, and in a modest establishment in Drummond Street, adjoining the Euston Station, on the 2nd January, 1842, the Railway Clearing House passed from theory into actual and practical existence. Its clearing at the same time included all through traffic of goods and passengers, parcels and live stock, between London and Darlington in one direction, and between Manchester and Hull in the other. There were nine companies included in the arrangement. It is curious to note of these there is now not one that has maintained its name—all having been absorbed either by the London and North Western, the North Eastern, Midland, or Lancashire and Yorkshire systems. The then existing companies were:—

London and Birmingham.
Midland Counties.
Birmingham and Derby Junction.
North Midland.

Manchester and Leeds.
Leeds and Selby.
York and North Midland.
Hull and Selby.
Great North of England.

This was the modest railway family with which Mr. Kenneth Morison started that system which has assumed such colossal dimensions, and is now under the management of Mr. H. Smart. Small and insignificant as the system appeared in its infancy, it was then, nevertheless, a great undertaking, and infinite credit is due to those who organised and carried out the details of the system. Fully to appreciate the value of the services rendered to the public, and to the railway interest, in the establishment of the system, let us see what was the amount of active work done in the third year of its existence (1845).

On the sixteen railways thus included in the system of clearing there were conveyed 517,888 through passengers. Each of these passengers was conveyed an average distance of 146 miles. The sixteen railways gave an aggregate length of 656 miles, or an average of 41 miles, so that each passenger passed through an average of nearly four junctions with other lines than the one on which he commenced his journey. But for the facilities given by the clearing, each passenger would have been required to change his carriage on entering the territory of another company. It is instructive to notice the proportion of the classes in 1845 as compared with what they would be at the present time. There were 234,000 first, 215,297 second, and only 63,581 of third-class passengers. Now the proportion of third class to the total would be over 91 per cent.; then it was only about 12 per cent. The total distance travelled by these passengers was 75,783,000 miles. In the con-

veyance of these passengers there were employed during the year 59,756 railway carriages, and there is another curious fact connected with the early history of our railways — 5,813 trucks conveying private carriages passed over these railways. This was for the accommodation of those who preferred to ride in their own carriages, instead of in the railway vehicles, a higher scale of fares being, of course, charged for this ostentatious display and greater luxury of travelling. The companies had not only to carry the passengers, but also the private vehicles in which they enjoyed the luxury of travelling without mixing with their fellow-creatures.

In addition to the work of apportioning to the respective companies their share of the receipts for the work done, the Clearing House took cognisance of the movements, the destinations, and the earnings of 7,573 horse-boxes—for those who preferred to travel in their private carriages had, of course, often to take with them the horses which were to be “put to” at the end of the journey. There were, further, 2,607 post offices carried on these railways, and the receipts from these were to be duly accounted for to the different companies. Finally, there were 180,606 goods waggons running over greater or less distances on these aggregated sixteen railways. All the work was done in a punctual, satisfactory, and business-like manner, and demonstrated as clearly as facts could do the groundless character of the apprehensions which had been expressed as to the establishment of the Clearing House.

There is no country in the world which can boast so complete, so well-ordered, and so extensive a machinery for aiding in the development of the great railway interest as that of the London Railway Clearing House, and we may claim for its originators and managers a fair share of that gratitude which the public, not over-liberal in these matters, should accord to those from whom they have received lasting and substantial benefits.

When the system was first established some unforeseen results were produced, which led to many angry discussions between the companies, who believed that their interests were adversely affected. The happy family of nine companies, which were gathered under one roof at Drummond Street, like the birds in the fable, "grew quarrelsome and pecked each other." Such highly improper charges as "dishonesty" were actually heard. The companies were, it is said, in the habit of appropriating each other's waggons, and refusing to give an account of them, or pay for their use. This dishonest practice had never, however, reached the height to which it was at one time carried by some of the American railway companies. There, in some notorious cases, the rolling stock was, to all intents and purposes, stolen. The Erie Company at one time appropriated some hundreds of carriages and waggons belonging to a line which they leased, painted out the name or initials of the lessor company, and replaced it by their own. In the early days of the Railway Clearing House, its managers had also to contend against other

difficulties, which in one of their early reports is thus explained :—

“ In the first place, the methods of keeping accounts adopted by the several railway companies were in no two cases exactly similar ; and this diversity of system caused much difficulty and confusion when the accounts came to be compared for the purpose of effecting a settlement. Long delays occurred, and much angry correspondence not unfrequently passed between the managers, before payment of the sums due by one company to the other could be obtained. In the next place, although all the connected companies had entered into an agreement to render accurate returns of the use they respectively made of one another's carriages and waggons, and to pay a fixed rate per mile for whatever distance they ran, still, the conditions of the agreement were from the first very imperfectly fulfilled, and some of the companies came in the end to make an unacknowledged use of the carriages and waggons of others to an extent which amounted to a positive grievance.”

Confidence in the governing body and in the integrity of its decisions was consequently the first condition that was required for the success of the association. The constitution of the body was, and is, based on the representative system. Every company that becomes a party to the Clearing House is represented by its chairman or one of its directors. He forms part of a committee upon whose resolutions are based the laws and regulations which govern the conduct of the business. The working out of the details is the task and function of the officials and clerical staff employed for the purpose. This committee of delegates holds its

meetings at intervals of three months. Among the other duties with which the delegates, as they may be termed, are charged, is the very important one of appointing seven of their members who constitute the committee of superintendence. It is to this body of practical and experienced railway men that Mr. Smart makes his monthly reports. These show what has been the work done during the month in the division of the through goods and passenger receipts among the affiliated companies, and all other matters of importance transacted during the period. There is yet a third body; perhaps it might not be inappropriate to designate it as the Lower House in the constitution. This body consists of the general managers of the railway companies. These meet quarterly, and discharge such matters of interest connected with the working of the railways as bear directly or indirectly on the question of through rates and their apportionment. Take, as an illustration, some great festival or gathering—say an exhibition at Glasgow—agricultural meetings, meetings of the British Association, Church Congresses, tourist arrangements, cheap excursion trains; all of which include arrangements for running over continuous and connecting lines of railway. At these meetings the fares or rates which may be decided upon are reported, and form the bases upon which the division of the receipts of the respective companies is made. There are yet further meetings and gatherings of officials which are provided for. Committees of goods managers, superintendents of companies, and railway accountants are

formed, and these, as well as the general managers, hold their periodical meetings, at which the business to be discussed frequently forms an agenda paper of many folios in extent, and includes a mass of detail, which to the lay mind would be abstruse, intricate, and unintelligible, but which has to be disposed of with the accuracy of a problem in the exact sciences.

With all this carefully thought-out system of check and counter-check there would, however, still be wanting one important element, if it had not been provided by Act of Parliament, and that is the power to enforce and compel obedience to the awards and decisions of the Clearing House. This was duly provided, and the Act establishing the legality of the association is surely one of the most complete of its kind ever passed by the British Legislature, for it has never required legal interpretation by the judges of the land. It orders, in terms which rival in brevity and authority the laws of the Medes and the Persians, that whatever is declared to be due by the Clearing House shall be legally due, and must be paid. There is no appeal from the decision. No wasteful or fruitless litigation has ever yet arisen out of the business of the Railway Clearing House. Rival chairmen and boards of railway companies may plot and counterplot against each other; may seek to invade each other's territory; dispute agreements, and cavil over their validity; but once within the scope and purview of the Clearing House there is an end to disputes and litigation—so far, of course, as its powers and jurisdiction extend. The Act was passed by Parlia-

ment without comment and almost without debate. It was drawn by one of the ablest of draughtsmen of public bills—the late Mr. Dodson, or, as he was more generally known and spoken of in the legal profession, “Doddy.” Parliament, indeed, never passed an Act which, whether in regard to the magnitude of the interests involved or the success with which its provisions have been carried out, has yielded such satisfactory results as the Railway Clearing House Act. Previous to the passing of this Act, the authorities of the Clearing House sometimes experienced delay in obtaining that prompt settlement of accounts which it was the spirit and the essence of the association to secure, and on one occasion, at least, they had to invoke the aid of the law courts. An official of one of the recalcitrant companies was summoned before Vice-Chancellor Kindersley for non-payment of the amount which the Clearing House had found to be due, and of which the court had ordered payment. “What,” said the indignant judge, “not obey the order of this court! What’s his name? Officer of the court, take that man, and”—this, of course, was *sotto voce*—“cast him into outer darkness.” A shriek of wild despair went up from the terrified official representing the company seated on one of the back benches of the court. He was not, however, consigned to the duration which his contempt of court had merited, but his personal liberty was only retained on the condition that the amount claimed should be immediately forthcoming. It is scarcely necessary to add that the sum claimed was duly paid.

The railways of the United Kingdom own—according to the last official returns available—and work a total of 806,000 locomotives and vehicles of all classes. These consist of 49,000 passenger carriages, 698,000 trucks and waggons, 37,000 Post Office vans, guards' vans, cattle trucks, etc., and the whole is worked by a stud of 22,000 locomotives. In 1901 these vehicles ran a total mileage of 399 millions. This is equal to over 16,000 journeys round the world, and represents a distance of over four times that of the sun from the earth. With the exception of some small lines and the Irish railways, the carriages, waggons, and "sheets," when travelling off the lines of their owners, come under the scrutiny of the Railway Clearing House. For all practical purposes, and so far as the public interest and convenience is concerned, all this aggregate of machinery of locomotion exists as the property of one company. State ownership of the railways could not be more effective and comprehensive than that which exists at the present time with regard to the railways of the United Kingdom. There is, however, this most important difference, viz., that while State ownership would involve a complete monopoly, the present system has the immense advantage attaching to private enterprise and competition of the several companies, which, for the purpose of facile and efficient working, are united under this arrangement. The business of each company, which forms an integral part of the whole, is conducted under a sense of personal responsibility which could not properly attach to a system



owned and worked under that mysterious and irresponsible entity called the State. Each company strives with the other to secure as large a proportion as possible of the favour and patronage of the public. Active agencies represent different companies, and canvass for business on their own account (there is a growing feeling amongst railway directors and shareholders that this rivalry might be usefully curtailed), giving to the trader and producer all the advantages of competition, and each company seeks—by the acceleration of its trains, or by the superior accommodation which it affords, or the inducements which it holds out of low fares for tourists or the pleasure-seeker—to secure as much as possible of the passenger travel of the country. The seemingly incongruous task of uniting combination with competition is accomplished by the agency of the Clearing House, and as a result we have a railway system unsurpassed in the services it renders to the public by that of any country in the world.

The key to the success of the beneficial work done in the Clearing House is the system upon which what is known as “the Mileage Department” is conducted. Without this, adequate checks could not be provided, nor could accurate apportionments of receipts be made among the several companies. The plan adopted, like that required for success in all other important undertakings, is very simple. The Clearing House has in its service a body of over 400 clerks who are engaged in what is called “the Mileage Department.”

In connection with this branch there is an outdoor staff of over 500 persons known as "number-takers." One or more of this useful body of men may be seen at all the important junctions of our railways. He takes no interest in the incomings or outgoings of passengers, the loading or unloading of goods, the signalling of the arrival or departure of trains. With a small book and pencil in hand, and at night with lantern under his arm, he walks along the platform, or ranges along the goods sidings, looks at each truck or waggon or carriage, notes down the number of each vehicle, and the name of the owner, where it came from, and its destination.

The duties of "the Mileage Department" of the Clearing House differ in one important respect from those connected with the distribution and apportionment of receipts among the respective companies—in one case the accounts represent "credits" to the companies, in the other all are "debits." Every company is informed of the amount, if any, which they have to pay to others for the user and detention of passenger carriages, trucks, waggons, tarpaulins, etc., travelling over lines not owned by themselves. It is difficult to convey to the ordinary reader an adequate idea of the magnitude and importance of the work performed in the collection and examination of data for ascertaining the amounts due under these heads.

Since the establishment of the Clearing House, returns have been collected by its own agents, who are designated "number-takers," and others supplied by the companies themselves, showing the number of miles

run by stock on "foreign lines"—that is to say, lines not the property of the company owning the stock. In the first fifty years the number amounted to the enormous aggregate of 18,626,931,374, exclusive of empty running. An express train travelling continuously sixty miles an hour would only run 525,600 miles in the year, and it would require to continue its journey for something like 35,000 years to equal this mileage. Had such a journey commenced with the Christian era, it would not by this time have accomplished much more than about one-eighteenth of the distance represented by this enormous aggregated mileage. But not only have the Clearing House officials tracked the course of the rolling stock running over foreign lines, but they have detected instances in which the carriages, waggons, trucks, etc., have been detained on lines over which they travelled for longer periods than was fair or equitable, according to the standard of work done, amounting in the aggregate to 26 millions of days. Since the date of the Creation, according to the orthodox chronology, the sun has risen and set upon only about one-twelfth of the number of days for which the Clearing House officials have charged "demurrage" for detention by foreign companies of rolling stock of which they were not the owners. The aggregate of delays represented by these 26 millions of days' demurrage is over 70,000 years.

Leaving for a while the consideration of these huge totals, we will endeavour to bring the operations of the Clearing House within more manageable and comprehensive figures, and trace them to the single unit from

which they start—viz. the task of that humble, and to the great bulk of railway travellers unknown official, the “number-taker.” In one year these officers traced nearly 13 millions of journeys of carriages, waggon, and sheets out from their owners’ lines. To some extent, but in the minority of cases, the companies over whose lines this rolling stock passed, from one cause or another, failed to use due diligence in returning the stock to its owners; in some cases they employed the stock for the purposes of their own traffic, and in other cases perhaps used the trucks and waggon for warehousing purposes. The total number of days represented by these delays was upwards of a million, or 2,700 years. For the purpose of arriving at these results, and enabling the Clearing House to make their claims upon companies for the user of stock not owned by themselves upon their own lines, a total of more than 19 millions of entries were required to be made by the number-taking staff.

As already intimated, the basis of all these bewildering and apparently complicated accounts rests upon the work of taking the numbers and particulars of the trains which pass through every junction station. At all hours of the day and night, in all conditions of weather, rain and snow, fog and sunshine, storms and frost, the “number-taker” must be at his post. His duty is to collect particulars of all trains arriving at or leaving the junctions. He has to give the number or name of the engine, the numbers of the carriages or trucks, the station whence they came, and to which they are destined. Here is a copy of an entry as made in his book

by one of the "number-takers" at one of the junctions, and taken in a heavy fall of snow. It is a fair sample of the mass of such entries with which his small book is filled. The number of the engine is "1421." It arrived from "Darlington" 5.40 a.m., left 6.45 a.m. The numbers of the trucks, the names of the owning companies, and the parts of stations were:—

L 33851	Wed.	Mkt.	L 48866
M 22775	"	Col	M 46612
L 30573	B'ham	G M	L 18787
20407 B	"		
19682 B	"	Nor.	
62851	New B'ton		
S E 11883	New Malden		
1244 B.			
H N 4473	Shep.	Stm'kt	
N S 5538A	Sheff.	K'cliffe	
N W 4624	Hist.	P'bro	◇ 7480
C G 2964	Rug.	G E	E G 48658
L 6056	1575 1164	2073 B	5634
	G N S and N B		
S E C 4485	S'ttgbourne	Wed.	S E C 7368
L 57425	Tip	Bir	L 29998
			3685
			3116
			3462
			2307
	Ely		
L 7703	11640	2570	7930 2141
1203	4328	4396	17658 518

The whole of this complete system of check and counter-check thus rests on the basis of individual returns and abstracts. These are reckoned by hundreds

of thousands. The returns, having been preserved with due care for a specified time, are handed over to what, in principle, resembles the "Queen's Pipe" in the Customs Department, where smuggled tobacco is turned to waste, to the infinite regret of those who would cheerfully give their personal aid in the consumption of the condemned "weed." A machine, something in the nature of the "devil" that tears and scratches the wool in its first stage of preparation of yarn, defaces and tears these Clearing House returns, and the "waste" is sold for the benefit of the association.

The return from the "number-taker's" book given on the previous page contained the designating numbers on the trucks and waggons and sheets which made up one train. There were forty vehicles, and they were owned by seven different companies. On each side of every truck or waggon that is despatched from a station there is placed a card or label, giving the date, name of forwarding station, route, name of the owner, the number, destination, and, in some cases, also the nature of the contents of the vehicle to which it is attached. Many of these distinguishing numbers in this particular train were made up of five figures, but in numerous cases the waggon numbers run into six figures. During the time which the train remained in the siding the "number-taker" had to take down over 300 figures, together with such important details as the names of the owners of each vehicle, the owner of the engine, the name of the guard, the time of arrival and departure of the train, whence it came, and whither it was destined,

and the description of vehicles—that is to say, whether ordinary open trucks or “box” waggons, or whether constructed to carry loads of unusual weight, 15 tons, 20 tons, 30 tons or above, or whether containing any explosive goods; and in the case of passenger stock the class of carriage, whether saloon, first class, second, third, or composite, or of special construction.

It frequently happens that a train arriving at the station has to be “shunted.” The “number-taker” has to follow it to the siding. At other times trucks are detached, and sent, some to a siding on one side, some to another. No matter whither it goes, the Clearing House detective must not lose sight of a single vehicle until he has secured all needed particulars, for sure as he should do so, the missing vehicle would turn up at some other station, where it could not expect to pass a second time the vigilance of the detective at that spot.

The particulars required having been duly noted in his small “blue book,” and the train being got fairly under weigh, the “number-taker” returns at once to his office, and there copies out in due order, in separate columns of figures, and under their respective heads, the details which he has collected. These “abstracts” are forwarded each week in due course to the Clearing House in London. Four hundred clerks arranged at their capacious desks receive, arrange, and post from these abstracts, which are sent in from over five hundred junction stations. The number of these abstract junction returns exceeds three-quarters of a million in

the year, exclusive of what are known as "nil" returns—that is to say, returns that report that no "foreign stock" has been noted at any particular station. The work of dealing with the returns commences with entering, under the names of the several companies owning the vehicles, the particular distinguishing number of each one that was found away from its owner's line. So long as the vehicle remains in the territory of its owner, it is out of the jurisdiction of the Clearing House. Having located the particular vehicle at the precise day, it is then necessary to record whither it went after leaving the station. The card on the side of the truck may have stated, for instance, that it was going from Darlington to Manchester. But by what route is not stated. It is the duty of the clerks to trace its route. Its number was, say, "35866," and it is the property of the North Eastern. When it left York it may have passed by one of several routes to Manchester. Here comes in the "topographical" knowledge of the clerks, who can tell by instinct as unerring as that which directs the swallow to or from the sunny south, by which and every route any two railway stations in the United Kingdom may be reached by railway. No. "35866" is certain to turn up at the nearest junction station after leaving York; or, if it does not, it must have been retained upon one of the lines concentrating at York. In the one case the company detaining the stock of which it is not the owner is debited with it until the missing vehicle is returned to its owner's line; if, on the other hand, No. "35866" does not in due course make

its appearance at Manchester, the assumed place of destination, then the company despatching the waggon so invoiced is called upon to account for the misdirection, and pay the penalty for its negligence.

Assuming the vehicle has reached its destination at Manchester, the company will take note of the arrival of the train, giving the same particulars corresponding to those which we have already specified. The abstract received at the head office in London will enable the clerk there to identify this particular vehicle, and, noting the day on which it started and the day on which it arrived, he is able to say whether due diligence has been used in despatch of the truck, or whether this or other vehicles may have been detained beyond the time agreed as the standard for charges of demurrage. A distance of 120 miles was once considered a fair day's run, but in these days of keen competition many trains are run upwards of 300 miles in the twenty-four hours. When the route over which the waggon has passed has been ascertained, the distance between any two points by such route is entered by the clerks from books compiled in the distance department. For the purpose of reference a standard book is provided containing the actual measured distances between some 17,000 stations, sidings, collieries, etc., and various junctions on the railway companies' systems. The book is in several volumes, and is of great bulk, containing, as it does, upwards of one and a quarter million separate ascertained and printed distances. From the distances therein laid down there is no

appeal, all the associated companies recognising them as the basis of calculations.

In posting up the mass of detailed information it is obvious that an enormous amount of clerical work must be performed. In order to economise the labour in making these entries, a system of "symbol" or shorthand writing has been adopted—based upon "dots" and "dashes." A "dot," for instance, placed over the number of a vehicle under a particular date tells that such a vehicle has arrived. A "dot" at the side tells the date at which it passed an intermediate point of exchange, while a "dot" beneath the number tells the date at which it arrived at the destination station. The number of days occupied in the journey is shown by a corresponding number of "dots." Similar symbols are used on the return journey, with the addition that a mark over and at the end of the top of the first figure shows the back mileage chargeable on the particular waggon. A similar mark at the level at the bottom of a figure indicates that the vehicle was empty, or that the sheet or tarpaulin was folded. A ring round the number and symbols signifies that the vehicle carried a light load, and was not subject to mileage charge. A "dash" under the whole number tells that the vehicle or sheet went through to a further station, and was not unloaded at the designated station as given on the attached label or card on the waggon. The complete tracing of the running of the vehicle from the time of leaving the owner's line and its return is signified by an angular "tick," thus "X" on the top of all entries.

Here, for instance, is the symbolical entry for a Cambrian waggon, No. 4120, that formed part of a goods train made up of waggons of various companies running from Aberystwyth *via* Welshpool and Wichnor:—

May 6.—4120—Date passing off owner's line at Welshpool.
 4120:—Date (7th) passing Wichnor (next exchange junction).
 4120—Date of arrival (8th) at Nottingham Station.
 ...

Return journey—

May 16.—4120—Date leaving Nottingham loaded to owner's line.
 4120.—Date (16th) passing Wichnor.
 4120—Date of exchange to owning company at
 " Welshpool (17th).

In this case the waggon was out of the owning company's possession from the 6th to the 17th. It arrived at Nottingham on the 8th, and as two days only are allowed for unloading purposes, three days' demurrage was incurred for undue detention, which, at 3s. per day, amounts to 9s., and is charged by the Clearing House against the company detaining the vehicles, and credited to the stock-owning company. These matters of detail having been arranged and duly checked by the clerks, the vehicle again appears with this symbol:—

✓
 4120:—Means that the running of the vehicle from the
 " time of leaving its owner's line to return thereto
 has been duly noted.



4120:—Signifies demurrage has been charged to the respective companies.

4120:—Tells that the vehicle or sheet went through to further station, and was not unloaded.



Signifies that the vehicle was light loaded, and was not subject to mileage charge.

The charges for demurrage are stated in the monthly accounts sent in to the respective companies. The companies against which the charges are made can, of course, check the statement, and, if necessary, can require further particulars to be supplied by the Clearing House, where all matters are so arranged and classified that the running of any one vehicle during the past four years over any line not the property of its own owners will be forthcoming for test and verification. The charges for demurrage made by the Clearing House are 10s. per day for the first-class, and 6s. per day for a second- or third-class carriage. Composite carriages with first-class compartments are charged at the former, and without first-class compartments at the latter rate.

For the waggon stock 3s. per day is charged generally, but special waggons of expensive construction range from 6s. up to 20s. per day; *e.g.*, if constructed to carry loads of 15 tons, 20 tons, or 30 tons, they are graded step by step, the highest charge being 20s.

The charge made for detention of tarpaulins, or sheets as they are termed, for covering waggons is 6*d.* for the first day, 1*s.* for each day afterwards; but the whole charge is not allowed to exceed sixty days, making together 59*s.* 6*d.* It is assumed that 60*s.* is the average cost, so that further charge would amount to something more than confiscation of the wandering and offending sheet.

GOODS TRAFFIC—SCRUTINY

It must have frequently come under the experience of travellers on arriving at railway stations to notice that, in place of the train by which they intended to start on their journey, a goods or mineral train of thirty or more laden waggons and trucks stands waiting for the "all right" signal; or perhaps a similar train may have rushed by, shaking the place to its very foundations, and they may have followed its course until the thunder of its roar, the beat of its engine, and the glare of its red lights have passed into the silence and darkness through which it speeds on its resistless way. That train, like so many thousands of others, is laden, it may be, with the output of collieries, metal from the furnaces and the forges, machinery from manufacturers of iron, bales of cotton, piece goods from the mills and warehouses, beef from Inverness, wheat from the Lothians, and agricultural produce of all kinds, which, with something akin to magnetic attraction, it had gathered to itself as it sped on its way. These waggons and trucks and their varied contents were collected and

formed into one train from lines of railway owned by different companies, and each having its own interest as carriers in the work which the great locomotive is doing for them. The spectator who sees only the rushing, hurrying train, or catches a hasty glimpse of its component parts, takes little heed of the quiet, methodical, caretaking analysis and examination which are required to start it on its career, or to ascertain what proportion, and how much of the sum total of the work done by that locomotive—represented by money—is due to each and every company over whose lines those trucks and waggons have already passed, or may yet pass before they reach their destination.

In discussing the subject of railway rates and charges there is no term more familiar than that of "classification." The original Acts under which railways were constructed specified articles, as already explained, to be charged at given rates according to the class or classes in which they might be located. Many hundreds of these private Acts were passed, and the classification and resultant rates differed in many instances widely from each other, whilst in other instances they resulted in absurdities, as, for instance, in one Act where eggs and iron gas-pipes were located in the same group. It was always the aim of the railway companies, even in a greater degree than the traders or the public, to simplify these crude and dissimilar parliamentary classifications and to bring order out of chaos by reducing to a reasonable compass the number of classes, while making full provision in each class for the articles required to be

carried. This pioneer classification of the railway companies, known as the "Clearing House Classification," after many years of useful service, became the basis used by the Board of Trade when considering the revision of the many and differing parliamentary classifications prior to 1893, referred to in a previous chapter.

The statutory classification as adopted in 1893 includes the names of some thousands of articles grouped and arranged under eight distinct classes, denoted by the letters A, B, and C, for the first three, and the figures 1, 2, 3, 4, and 5 for the remainder. In classes A and B minerals are included, and other traffic of a rough and heavy description; Class C denotes those goods which pass from "station to station only" in specified quantities, the remaining classes providing, article by article, for practically all the traffic usually carried by rail, while appended to this general classification is a supplementary or special classification, in which are grouped as "explosive or other dangerous goods" upwards of two hundred items, all being articles requiring the precaution of some special form of packing or handling. As may be supposed, the classification reads like a miscellany or catalogue of a trade or museum. For instance, under the head of hardware there are grouped some two hundred articles of such various descriptions as: nut-crackers, dustpans, coffin furniture, fireguards, handcuffs, Jew's-harps, corkscrews, sardine-tin openers and sugar-nippers.

All merchandise enumerated in the different classes is charged at avoirdupois weight, except, provided other-

wise, for stone and timber. The weight is ascertained at the invoicing station, whence the goods are despatched, and the rate per ton chargeable is taken from the statutory rate-book kept by the railway company at the station.

By the establishment of the Railway Clearing House ample means are provided for identifying every goods train that travels past any foreign junction with any railway, the trucks and waggons of which it is composed, and the miscellaneous contents which they carry. The passage of every train is duly recorded at junctions and stations, and every vehicle of which it is composed is noted down with unerring accuracy, and the records gathered from all parts of the journey find their way to the Clearing House, and are submitted to a scrutiny from which there is no escape. Divested of the confusion created by the vast dimensions of the traffic, and taking one set of transactions as typical of the hundreds of thousands with which the Clearing House has to deal, the reader will be able to appreciate the extent to which simplicity and efficiency are combined in the system on which its business is conducted. Assume that a trader or any other person sends coal, hardware, or other material from Darlington, on the North Eastern, to, say, Lincoln, on the Great Northern. He will settle with the goods manager, or his representative, the weight of the goods to be forwarded, and he will find the charge in the railway company's rate-books at the railway station. These matters arranged, traffic is duly forwarded and entered upon an invoice which

accompanies the goods, setting forth the weights and charges. At the end of the month the station agent includes the total of this invoice in the abstract, which he forwards to the Clearing House printed in black ink, and forming a summary of all invoices forwarded to the same station during the month, giving the name of the station from which the goods are sent and that of the station to which they are forwarded. The abstract includes the names of the owners and numbers of the waggons, description of the goods sent, whether they are "carted," "non-carted," or "mineral"; the amount "paid" or "to pay." The invoices accompany the particular goods to their destination. When the goods have reached the station to which they are consigned, the receiving station clerk fills up a "red" (or "received") printed abstract, specifying the nature, weight, charges, etc., of the goods received, and the company from which they were received. If, on comparing the "black" and "red" abstracts, the figures given do not exactly correspond, the discrepancy is pointed out by the Clearing House to each station. If the forwarding clerk returns the document marked by himself as "correct," and the receiving station agent insists that he, too, is "correct," the disputed item is carried to an "inaccuracy" account, to be dealt with at a future monthly settlement if time does not admit of its being arranged in time for striking the monthly balance. If the error is admitted on the part of either or both the sending and receiving agents, the returns are altered accordingly, and the clerks proceed to the apportion-

ment of the amounts due to the sending and receiving companies, and also to those companies whose lines have been used in the transit of the goods.

Before the amount is agreed upon for apportionment among the companies by mileage, there are a number of deductions and allowances to be made. If the forwarding company has "paid out" any sum for special charges for collection of the goods, such amount has also to be allowed. For example, amounts paid out by the forwarding company for pier dues, port charges, or road-carrier's freight; also extra mileages or tolls allowed under Act of Parliament for, say, the Severn Tunnel, or the Forth Bridge, or Tay Bridge, or for expensive local lines in London; also for the use of portions of another company's railway.

Then the terminal charges are deducted according to the class in which the goods fall. These are fixed by agreement between the companies, and the due amounts are credited to the sending and receiving companies. Having cleared the ground so far, there yet remains one other item to dispose of, and this, unfortunately, is one which enters very largely as a disturbing element into the calculation of the sums to be awarded to each company. We refer to claims which arise for compensation for loss, damage, or detention of goods. Details of claims of this kind are forwarded after comparison with the original invoices of the goods sent out or received. The amount to be paid under this head is charged to each of the companies over whose lines the goods are traced, in the proportion which the sum bears to the whole amount

to which they would have been entitled in the division of the gross receipts, or in other ways as may be agreed.

The same arrangement is made when a company makes a bad debt in respect to the articles conveyed. The amount of the debt is compared with the invoiced accounts, and, if found correct, is passed. The loss by bad debts on freight forms a not inconsiderable item for railway companies.

There yet remains one further item to eliminate from the accounts before the net sum available for division among the carrying companies is settled. Goods traffic, the total value of which between a pair of stations is 20s. or under per month, is taken from the total and carried to the "Light Traffic" Account. The mileage calculations of such small sums would cause a vast amount of trouble and involve much additional clerical work, while the results attained, represented only by fractions more or less trivial in amount, would have relatively but a small appreciable effect in the general distribution of the receipts. It is arranged, therefore, that the aggregate of the items for goods up to and inclusive of 20s. shall be treated as "hotch pot," and divided among the companies in the same proportion as the larger amounts. Finally, when all is prepared for adjustment, a commission of $\frac{1}{4}$ per cent. is allowed to each company as the cost of collection and settlement of accounts between the respective companies and their customers.

It may here be mentioned that the mileages upon which the through traffic receipts are apportioned to the companies interested are made up by the Clearing

House from the measurements given on the engineers' diagrams supplied by the companies, and these mileages, which number upwards of a million and a quarter, are recorded in the ten volumes which comprise the Clearing House Distance Book.

In order to work out the "settlement" of an account between each pair of stations, assuming that the invoices or accounts were the subjects of the inquiry and verification already specified, the Clearing House officials often use, in the process of eliciting truth, checking error, and distributing their portions to each company, not less than eighteen separate forms, printed, for facility of reference, in red or black.

It will be seen from the effective system of check and counter-check which each company has provided against the other through the agency of the Clearing House that great and systematic frauds are rendered impossible. Under the most scrutinising system which human wisdom could devise there would still be some scope for the action of dishonest officials working in collusion, and some errors and inaccuracies may pass unnoticed and uncorrected, but the many and rigorous checks which are provided raise obstacles at every step to deliberate fraud, and reduce to a minimum the risks and chances of error in the accounts of that wonderful institution, the Railway Clearing House.

The question has frequently been asked, rather, perhaps, as an interesting addition to statistical science than as having any direct practical value, what is the average distance travelled by a passenger on the railways of the

United Kingdom? We know from the annual returns the number of passengers, or rather the number of journeys made by passengers on railways, and we know also the number of miles run by the railway trains each year; but there is no such connection between the two sets of figures as would afford materials for throwing light upon the question of the average distance travelled by each passenger. For every ten persons that would travel, say, from London to Edinburgh, or Bristol, or Liverpool, there are many thousands who would pass over the short distances between the stations on the metropolitan and suburban lines. Several of the American railways do give in their annual reports the number of passengers carried one mile, but this information refers only to the particular railway owned by the company giving the information, and does not include that portion of the passenger traffic which passes from one system to another. It might be supposed that the British Railway Clearing House would be in a position to throw some light upon the question of average distance. This, however, is not the case, for while an American railway company deals only with the traffic upon its own particular railway, the Clearing House deals only with what is termed the "foreign traffic,"—that is to say, business travelling over lines other than those on which it originated. In the absence of actual and reliable data, but based on materials afforded by the returns of many of the companies, it is assumed approximately that the average distance travelled by each passenger on the railways of the United Kingdom

is 17 miles. We know from the annual returns of the Board of Trade that the number of passengers—exclusive of season-ticket holders—carried in 1901, or, more correctly speaking, the number of journeys made (for a passenger may make hundreds of journeys during the year) was 1,172 millions. On this estimate the aggregate number of miles travelled in the year was about 19,924 millions. The influence which this astounding movement of populations must have upon modern civilisation and the progress of nations, is a subject which some future Buckle, treating of the history of civilisation, will not ignore.

The trains which conveyed the 1,172 millions of passengers ran 224 millions of miles. The trains whose running made up this aggregate of train mileage were distinct and separate from the goods or mineral trains, which ran 173 millions of miles during the year. The description of work performed by the goods or merchandise and mineral trains is clearly indicated by their names. This is not so, however, in the case of the passenger trains. It is true they carry passengers, but they do more than this—they carry parcels, dogs, horses, carriages, and His Majesty's mails. These trains contribute a very large proportion of the revenue of our railways. Passengers contributed over 39 millions of revenue, while the receipts from all included in the parcels department were about six millions, and from the carriage of the mails one million in the twelve months.

It is the business of the parcels department of the

Railway Clearing House to apportion to the companies being members of the association the amounts due to each of them in respect of parcels carried over lines owned by them to their destination. The number and variety of parcels conveyed by the railways, like all other statistics connected with the working of the systems, is represented by millions. The actual numbers are not accessible, but we know from the annual return of the Post Office that the volume of the parcel traffic collected and delivered by that department, the vast majority of which was carried by the railways, represents about 90 millions of packages. While, however, the Post Office deals only with parcels of limited weight and dimensions, the railway companies treat as "parcels traffic," transmissible by passenger trains, horses, dogs, and carriages. They also treat fish, fruit, and perishable articles, requiring to be conveyed quickly to market, with the same indulgence, and allow it to be forwarded under certain conditions by passenger trains.

Even to the superficial observer it must be obvious that the work of assigning to each company the portion that falls to its lot for its share in the work of transporting the enormous and heterogeneous collection included under the head of "parcels" must necessarily be very laborious and detailed in its character. Laborious it certainly is, if by the term be understood the amount or quantity of labour required. And this labour, although not of a character calling for the exercise of exceptional genius on the part of the great bulk of the persons employed, yet demands for its due performance a large

amount of technical knowledge and skill which is only to be acquired by training and experience. The rapid development of "parcels" traffic, consequent upon the successive cheapening of rates and the continually increasing facilities for its collection and delivery, has necessitated the introduction of broad and economical methods of dealing with the vast number of returns. Hence it is magnitude rather than complexity which characterises the work performed. Elaborate systems would break down beneath the heavy strain to which they would be subjected. The four hundred clerks who are detailed for the parcels service have to compare, collate, and check returns as they are received from the railway stations, make entries on forms specially designed for their use, and calculate results from tables of distances and mileage rates, which are placed abundantly at their disposal. In many cases, however, the work is complicated by the more or less intricate agreements and working arrangements subsisting between companies. The aggregate of work done is none the less remarkable because it is made up of separate and, it might almost be said, infinitesimal details.

The different railway companies are required to send monthly to the London Clearing House returns of the passengers booked through to other companies' lines. It was formerly also required that the tickets, when delivered up by the passengers at their destination, should be sent to the Clearing House. These tickets gave the names of the issuing station and the station for which they were issued. The Clearing House, of

course, in making each separate settlement, deals only with business as between the two terminal stations.

It is one of the facts that are not very generally known that there are upwards of 18,000 stations, junctions, sidings, collieries, etc., on the railways of the United Kingdom. Most of these are provided with more or less accommodation for passengers, goods, livestock traffic, loading and unloading furniture vans, carriages, portable engines, and machines on wheels, and with crane power, details of all of which are distinctly specified in the voluminous handbook of reference prepared by the institution. If each of these 18,000 stations had booking arrangements with every other in the country, the number of separate fares and tickets that would be required would be counted by many thousands of millions; it would require astronomical numbers to express the aggregate of possible annual transactions. The journey from London to Liverpool is represented fortunately but by one ticket, but between the two termini there are many stations, most of which have booking arrangements not only with the majority of others on the same system, but to a widespread extent with stations on other connecting railways. Large as may be the area over which this issuing power extends, it has its limits fixed by the demands of the public and the accommodation which can be afforded for the storage and issue of tickets.

The number of passengers carried upon our railways was 1,172,000,000 in 1901, and of these a large proportion travelled over more than one railway, and were, there-

fore, brought within the cognisance of the Railway Clearing House. There are upwards of 40,000 pairs of stations between which through tickets are issued every month, and the adjustment of the accounts for this portion of the railway traffic is transacted by a staff of 400 clerks, formed into seven divisions.

Instead of sending the whole of the tickets issued to the Clearing House—as was formerly required—it is now considered sufficient, in the majority of cases, to give merely the initial and closing numbers of the tickets issued. The interior of the office of the issuing clerk at a railway station is decorated, in some of the larger stations, with piles of tickets, stored according to the names of the stations for which they are intended in exact numerical order, each one bearing its number of the series to which it belongs. As each ticket is required, it is drawn from the lowest or bottom of the series. Each one above it next in order bears a higher number. The tickets are issued to the booking clerks in parcels of from 50 to 100 in number, or according to the demand for them. Each ticket, as railway travellers are aware, is forced into a weighted stamping machine, which prints upon the ticket the date of issue. When the booking clerk makes up his monthly return for the Clearing House, he simply gives the progressive number of the first and last of his series of tickets. On the information supplied, the Clearing House has to trace the route of the passengers, follow them to their destination, note how many, and what other, lines they have passed over in their journeys, and allocate to each of

the companies upon whose line they travelled that portion of the total sum paid to which each is entitled. This is calculated not only according to the actual mileage travelled on the line, but also in many cases on the special rate which each company has authority to make and charge. In some cases a three- or four-mile rate is charged for only one mile travelled. These and many other local differences of fares have to be calculated in order to arrive at the correct apportionment of the money among the railway companies.

For the purpose of ascertaining the portion due to each company, the Clearing House has to take cognisance of all working and traffic agreements of the companies *inter se*, the respective routes by which traffic can pass to its destination, the nature of the working agreements between the companies interested, the particulars of all special rates and exceptional fares and charges—every detail, in short, connected with the working of the railways. The adjustment of the accounts in respect of the passenger does not involve the same amount of labour as is required for the goods department. Passengers are booked *per capita*, and not according to weight or bulk. When once started on his way, he is a passenger pure and simple; first, second, or third, as he may have elected to be on taking his ticket at the booking office whence he started. As payment to the company is made on taking the ticket, the accounts are to that extent simplified, and the amount received has to be divided in clearly defined and specific proportions. In making the division among

the respective companies great care has to be taken that no one company receives more than its due share. A dozen lines may be travelled over by the holder of one through ticket, and upon these lines different local rates and fares exist. It is the duty of the Clearing House to see that in its final distribution no one company receives more than its established local fares, though it may well be that a sum below the local rate may be awarded as the share due to such line of the total amount paid for the through ticket. In addition to the tickets issued to well-known stations, it not unfrequently happens that a passenger requires to be booked through to a station to which no ticket had been issued for months, and no other may be required for an indefinite period. In order to suit the public convenience in these cases, the clerk is supplied with "blank" tickets, on which he fills up the name of the station required. These tickets introduce new elements of check and calculation in the ordinary routine work of the establishment; the "through route" traversed, as in the case of other tickets, has to be ascertained, and the due proportions given to the several companies over whose lines the owner of the ticket has passed. Then, again, there are tickets issued at special rates for the military and naval forces, the police, and other persons travelling at the expense of the Government, at reduced rates.

The Clearing House acts not only as a book-keeper for the railway companies, as companies, but it provides an unfailing check for those which are members of the association so far as regards their own booking clerks

The booking clerk at every station has to make a return monthly of all descriptions of tickets (distinguishing ordinary, tourist, excursion, or other) issued by him, the different classes of the tickets, the stations for which they were issued, the "cut" or half-tickets issued for children, the consecutive numbers of the tickets issued, and the amount of money for which the station is responsible in respect of such tickets. If the numbers given are not consecutive, the error is at once detected, for a record is kept of the latest number given by the clerk at the previous return. If the commencing number of a new month does not follow immediately on the closing number of the previous month, the error is at once manifest. One section of the younger clerks in the office is occupied with arranging all the tickets that are sent in, after having been used by the passengers, according to their original station, class, and consecutive numbers. When all this sorting has been done, the tickets are compared with the station returns, and if any discrepancy appears, the station issuing the tickets is debited with the amount. The practice of "nipping" the tickets at different railway junctions with various forms of dies is one among the modes adopted by the Clearing House for ascertaining the routes by which the passenger has travelled. Take, as an illustration of the work performed, the division among the several companies of the amount received for a ticket issued, say, from Plymouth to Inverness. The route might be *viâ* Bristol, Settle, Carlisle, Hawick, Larbert, and Perth. The distance (731 miles) would be thus distributed: —

	Miles.	
Great Western . . .	129	Plymouth to Bristol.
Midland . . .	315	Bristol to Petterill.
North Eastern . . .	1	Petterill to Carlisle (Citadel).
North British . . .	126	Carlisle to Larbert.
Caledonian . . .	42	Larbert to Perth.
Highland . . .	118	Perth to Inverness.
	<u>731</u>	

Here is another specimen ticket from Manchester to Lairg, route *viâ* Hellifield, Carlisle (Glasgow and South Western), Glasgow (St. Enoch), Glasgow (Queen Street), Forth Bridge, Tay Bridge, Montrose (Kinnaber Junction), Aberdeen, Keith, and Mahon :—

	Miles.	
Lancashire and Yorkshire . . .	49	Manchester to Helli- field.
Midland . . .	76	Hellifield to Carlisle.
North Eastern . . .	1	At Carlisle.
Glasgow and South Western . . .	92	{ Carlisle to Kilmarnock. Gorbals Junction to St. Enoch.
Glasgow Barrhead and Kilmar- nock Joint . . .	24	Kilmarnock to Gorbals.
North British . . .	111	{ Glasgow (Queen St.) to Dundee. Arbroath to Kinnaber Junction.
Dundee and Arbroath Joint . . .	17	Dundee to Arbroath.
Caledonian . . .	38	Kinnaber to Aberdeen.
Great North of Scotland . . .	53	Aberdeen to Keith.
Highland . . .	122	Keith to Lairg.
	<u>583</u>	

These may serve to illustrate the nature of the work performed by the Clearing House, in respect of the "through" passenger traffic of our railways.

One of the purposes sought to be served by the Clearing House was the creation of neutral ground, where the executive officers of the different lines could meet and discuss matters of mutual interest connected with railway management. This has been fully realised, as has been previously stated, and the Clearing House meetings are quite a recognised institution. Some indication of the magnitude of the transactions settled by the establishment may be obtained from the following brief statistics. The annual amount of money cleared is now over twenty-seven millions, represented by the payment of about two millions as balances. The number of settlements in which two or more companies are concerned made yearly is as follows: In the Merchandise Department, seven millions; in the Passenger Department, nine millions; and in the Parcels and Miscellaneous Department, five and half millions, making an aggregate of over twenty-one millions. The total staff employed, including the outdoor staff, is now only a few short of 2,800, all under the responsible management of Mr. Harry Smart, the secretary under the Clearing Act, who is assisted by four principal officers, the whole being under the control of the Superintending Committee, composed as follows: Lord Claud J. Hamilton (Chairman), Great Eastern Railway; Sir James Thompson, Caledonian Railway; Mr. Lesley Charles Probyn, Great Northern Railway;

Mr. Charles Mortimer, Great Western Railway; Mr. Theodore Julius Hare, London and North Western Railway; the Right Hon. Lord Farrer, Midland Railway; and Mr. John Cleghorn, North Eastern Railway.

Such is an outline of the clearing system and its work. Its value to the railway service need not here be insisted upon, because it is admittedly indispensable; the public facilities for through traffic afforded by the English railways, which are unequalled, having called it into existence. The wider, therefore, the development of the idea is known, understood, and appreciated, the greater will be the benefits conferred upon those who travel or forward their commodities by railway.

In connection with the association are a Superannuation Fund, a Contingent Sick Fund, a Provident Association, a Literary Society, a Dining Club, a Co-operative Society, a Coal Supply Association, an Athletic Club, a Volunteer Fire Brigade, and a Permanent Benefit Building Society.

RAILWAY COMPANIES AND THEIR EMPLOYEES

The relations existing between railway companies and their employees have, on the whole, been throughout the history of railway enterprise in this country of a satisfactory character. Sections of the men have occasionally been stirred up to strike by agitators; but these have represented but a very small proportion of the whole number employed. Latest returns show that the total number of railway employees in the United Kingdom is 576,000, and of these the Amalgamated

Society of Railway Servants—the society responsible for most of the strikes which have taken place—could for 1901 claim but 55,941, against 62,023 and 59,819 in the two previous years as members. Only one company has recognised this Union for the purposes of negotiation as representing the men, and the experience gained has not been of a character to encourage the directors of other railways to give up their policy of dealing directly with their employees without the intervention of outsiders. The great fight which the Taff Vale Company won against the Amalgamated Society, the legal decisions arising out of which have completely broken the strength of Trade Unionism in regard to “picketing,” etc., showed what could be done by decision and firmness in meeting an unwarranted attempt by an outside body to interfere with the management of a railway.

All the work in connection with the movement of trains is unhappily of a more or less dangerous character, and the loss of life is sadly heavy ; but the employment offered by the companies is steady, and there are many advantages attaching to it beyond the regularity of the pay. In days prior to the Workmen's Compensation Acts, the companies subscribed very generously to funds for the benefit of their employees, and some have still societies offering very liberal terms to the staff. The Workmen's Compensation Act brought in last session, but not carried through, extended the principle of compulsory compensation so widely that every employee would, under its provisions, have his

legal remedy for almost every casualty that could befall him in the discharge of his duties. Under a recent decision of the House of Lords, it has been held that a man who ruptures himself in his work can claim under the existing Acts.

There is still one great representative charitable institution which survives the new relationship created by the Workmen's Compensation Acts, and helps materially to maintain the kindly feelings between employer and employed fostered by the funds on which railway servants were largely dependent before the law gave them their legal claims in case of accidents. This society is in many ways so exceptional in its character and management that a few details as to its work will be read with interest. The Railway Benevolent Institution, which is under the patronage of His Majesty the King, Her Majesty Queen Alexandra, and H.R.H. the Prince of Wales, was established in May, 1858, and is non-political and unsectarian. Its design is to relieve distress, and all classes of officers and servants in the railway service of the United Kingdom are eligible for membership. The extent of its usefulness depends in a very large measure upon public support, obtained mainly by railway directors and officials; the qualifying subscription for railway men is—for officers, 10s. 6d., and for servants, 8s. per annum. The railway companies also, by subscribing annually to its funds, give their official recognition to the institution, which is controlled and managed by their chief officers, every proper case of distress being carefully and sympathetically investi-

gated, and promptly relieved as far as the funds will allow. The present chairman of the board of management is Sir Charles J. Owens, General Manager of the London and South Western Railway Company.

The objects of the institution may thus be summarised : To grant permanent annuities (which are paid out of the interest of invested capital, so that they may be always secure), of from £10 to £30, to railway officers and servants when in distressed circumstances and permanently incapacitated by old age, disease, or accident, and also to their widows ; and to educate and maintain orphan children between the ages of six and fifteen years. Children of railway officers are sent to private schools selected by their parent or guardian and approved by the board of management, the expenses of their maintenance and education being defrayed by the institution. Children of railway servants are provided for in the Orphanage at Derby. Permanent annuities have been granted to 484 officers and servants, and to 1,404 widows, and 1,484 children have been maintained and educated in the Derby Orphanage, and at private schools.

Temporary assistance is given from time to time to all those classes until permanent relief can be secured from the funds, such temporary assistance given in the past year (1902-3) amounting to £7,513.

Special inducements are offered to railway officers and servants to enable them to insure their lives in well-established offices by offering exceptionally favourable terms, subdividing the annual premiums into weekly or

monthly instalments, and granting to members either a reversionary bonus of 10 per cent. on the amount insured, from the funds of the institution, or an abatement of $2\frac{1}{2}$ per cent. from the premiums charged by the companies according to the tables selected. Upwards of £326,000 has been secured to railway officers and servants by policies of insurance.

There is a special benevolent fund to relieve by gratuities all applicants in distressed circumstances amongst officers and servants, their widows and orphans, whether subscribers to the institution or not. The amount distributed to non-members and their widows and orphans in the past year amounted to £3,057.

The rules of the institution provide that any donor paying to the funds of the institution a gift of stock or money sufficient to establish an annuity, such annuity shall bear the founder's name, and he shall have the right of nominating a properly qualified person to an immediate pension, and of supplying any vacancy during his lifetime, but that after his death the right of filling future vacancies shall belong to the institution. The following proprietary pensions have been established in accordance with this provision by the generous special gifts of donors:—

96 pensions of £30 per annum each,	1 pension of £14 per annum each,
8 " £25 "	3 pensions of £12 "
10 " £20 "	39 " £10 "
2 " £16 "	2 " £5 "
9 " £15 "	

making in all 170 pensions, amounting to £3,897, which are all appropriated.

Grants are also given from a Casualty Fund (not exceeding £5 in any one case during the year) to those who are injured in the performance of their duties, and the widows of deceased members. Upwards of 120,000 men are members of this fund for the present year, the subscription to which is one shilling per annum. The number of persons relieved from the Casualty Fund in the last five years is as under :—

Year.	No. of members subscribing.	Killed by accident.	Injured by accident.	Died from illness.	Total persons relieved.	Proportion.
1898 . .	115,597	152	4,159	487	4,798	1 in 24
1899 . .	114,903	142	4,161	449	4,752	1 in 24
1900 . .	110,379	159	3,769	505	4,433	1 in 25
1901 . .	113,774	120	4,062	408	4,590	1 in 25
1902 . .	118,712	141	4,357	457	4,955	1 in 24
Total for 5 years	<u>573,365</u>	<u>714</u>	<u>20,508</u>	<u>2,306</u>	<u>23,528</u>	

On the average 95 persons were relieved from this fund each week throughout the past year, or, say, 16 every working day.

The expenditure in relief last year was as under :—
By payments: widows, £18,363; members, £8,083; children, £2,695; children, Derby Orphanage, £4,333; special benevolent gratuities, £3,057; and Casualty Fund, £5,858.

The income of the institution from all sources for the financial year, which ends on April 30th, has risen from £2,230 in 1859 to £42,875 in 1889, and to £63,141 for the past twelve months.

Each year, after all claims have been met, the balance of the revenue is invested for the purpose of providing

the pensions granted to members and widows. It is requisite to raise additional funds to meet the new claims for permanent allowances, which increase in number each year.

In order to prevent the expense and disappointment caused through election by ballot, the system of admitting annuitants by votes at contested elections has been suspended until such time as the income shall be absorbed. All candidates for permanent annuities (which are paid out of interest) are now admitted in rotation, and those who cannot thus be provided for are granted contingent annuities out of revenue until transferred to the permanent list.

While it is a general principle of the institution to relieve those first who have shown some willingness to help themselves by becoming subscribers, assistance is not confined to the members, for it has been agreed that a sum not to exceed £5,000 per annum may be apportioned by the Board to relieve deserving cases of distress in the railway world, irrespective of membership.

Everyone who gives a donation or subscription to the institution is qualified to recommend cases for relief. No properly qualified claim for assistance is ever refused, and arrangements have now been made to pay, from the funds of the institution, for the maintenance of railway men (subscribers and non-subscribers) recovering from injury and sickness, at convalescent homes in different parts of the country.

The annual dinners of the Railway Benevolent Insti-

tution have been presided over by leading men of the day, including His Majesty the King and H.R.H. the Prince of Wales. His Majesty the King (when Prince of Wales), in the course of his speech at one of these festivals, said :—

“The railway companies give the institution in every way their official support, and they may indeed well do so, because there is no institution which more heartily deserves our support than this.

“I hope you will believe that nobody feels more deeply for this institution than I do, and that nobody advocates its claims more ardently than I.”

CHAPTER IV

RAILWAYS AS INVESTMENTS

CONSIDERING the vast changes in social and business methods and the varied developments of mechanical science, it is somewhat surprising that, during more than half a century now elapsed since the establishment of railway communication, so little alteration has taken place in railway methods generally, and that such uniform results should have been secured from an investment point of view. The latter feature might, indeed, have been expected as a result of the adjustment of the respective claims of the customers and of the proprietors of railways. The public require and demand continued increase of facilities for travel and transport, and additional accommodation cannot be given without increased outlay. The capital expenditure on railways is thus never-ending, and its growth is obviously justified so long as a proportionate addition is made to the earning power of the lines. Addressing an earlier generation of railway shareholders, some of whom had raised the oft-debated question of capital increase, Sir Richard Moon, the then Chairman of the London and North Western Railway, startled his

hearers by the remark that "if the capital account were closed the Company could never pay another dividend." There was sound sense in this seemingly pessimistic pronouncement, but its application may of course lead to abuse. There can be no doubt that the facility with which new capital powers have been and are obtained from Parliament, and the readiness with which new issues are absorbed by the public, constitute a standing temptation to railway boards to cover up revenue deficiencies and make things pleasant for themselves and the proprietors. It must be remembered, however, that safeguards exist in the specified forms of accounts, verified by responsible officials of a company, which should prevent deliberate misrepresentation as to the position of any railway undertaking. The engineers are required to certify that the line and its equipment have been maintained in good and efficient condition, and the auditors testify to the proper apportionment of capital and revenue charges. Nevertheless, in the past a certain amount of looseness prevailed, and new money has been raised for purposes which on a strict accounting might have come out of current receipts. The questions involved have obtained additional prominence of late in connection with the tendency shown towards an increase in working charges, and a consequent reduction in the dividend funds of the various lines. It is contended by some that regular reserve funds should be created to offset the depreciation which must inevitably take place in the property and appliances of a company.

It would doubtless have been better in the initiation of railway enterprise if such a course had been pursued. The tendency would have been towards an equalisation of railway dividends, though on this score there is not much to complain of on the part of shareholders. To take the case of the rolling stock of a railway, the portion of the property most exposed to wear and tear. As a matter of principle, the engines and carriages provided by capital outlay are repaired or partially renewed out of revenue from year to year, while additional and improved stock is rightly covered by fresh capital. The companies, however, recognise the fact that from time to time types of construction tend to become obsolete, and it is customary to make exceptional revenue charges for the replacement of such, even while they may still remain in service. In the same way, the strengthening of the permanent way and bridges to meet the requirements of heavier loads, has been in several cases provided for by exceptional debits to revenue. Circumstances have varied with varying classes of business; but on the whole it may be said that no proof has been adduced of the charge recently made by critics, foreign and domestic, that railway capital expenditure here has been "profligate." The principle laid down has been that the lines and their equipments should be maintained out of current revenue and that all surplus earnings, after paying fixed charges, belong to and should periodically be divided among the shareholders.

Lord Stalbridge, the present Chairman of the London

and North Western Company, has recently explained the policy of the directors of that system in regard to capital and revenue as follows :—

“Speaking generally, the policy of this Company has been to charge to revenue, if not in one half-year, at all events over a period of a few half-years, all expenditure which is not likely to be remunerative, or to effect greater economies in working ; and it may interest you to know that since this Company took over the old London and Birmingham Railway, they have charged to revenue £1,854,000 against their carriage stock, although that stock to-day is of far greater value than when it was originally laid down. Take another instance. If you look at the question of shop alterations during the last ten years, we have charged to revenue the sum of £190,000 under this head, though nearly all the work has been of an additional character, and therefore would by many companies have been charged to capital. The expense of electric lighting in our trains will not be a capital charge any more than the expense of taking over the business of Pickford and Co., though that has resulted in a saving to the Company, and in fact produces additional revenue. In our Locomotive Department in the last ten years we have paid out of revenue £180,000 for new and additional engine sheds and water-supplies all over the line, whilst maintenance of way has in a similar manner borne a cost of £960,000 for signals, sidings, and sundry works, and a further £395,000 for works which have been superseded. I only mention these figures to you to show how conservative the policy of the directors has been, and will continue to be, on this question ; and before we discuss even the question of a dividend it is our duty, as it is our intention, to see that every proper charge is put against revenue for the depreciation, equipment, and working of the line.”

In the case of the Midland the Chairman is reported as saying :—

“I will give you two illustrations which I think will show you very clearly what our practice is. One is from the Locomotive Department, and the other is from the Way and Works Department. During the last half-year we have built ten very large passenger engines. They have cost about £30,000. They have been built to replace ten engines of an older and smaller type which cost about £23,000. The whole of the £30,000 has been charged to revenue. Now, gentlemen, let me give you the example from the Way and Works Department. I told you just now that Mr. Johnson had built some very magnificent engines to run on our line. When these engines were going to be put upon the line, Mr. McDonald, who is responsible for its safety, came and advised us that certain bridges should be renewed. I have no doubt in the world that there was a sufficient margin of safety without renewing these bridges, but English engineers are, perhaps, rather over-cautious, and I do not think we can blame them. At any rate, your board sanctioned it at once that the bridges should be pulled down, and should be put up as stronger and much more expensive structures. This work has been done, and the whole has been charged to revenue. Now, with reference to our practice with reference to large alterations of stations, such as are now going on at Nottingham and Sheffield, and as has been done at Kentish Town and Leicester. What we do is this. We, as nearly as possible, find out what was the cost of the old station which has been destroyed; then we charge that, and something beyond it and over it, to revenue. The extra accommodation is charged to capital. New widenings of the line are charged to capital, and so they should be. If not, why should you not charge the whole of the New Mills and Heaton Mersey Railway to revenue?—for, after

all, that was really merely a doubling of the line between those two points. You know if it is your wish that you should give your dividends for the betterment of the line, and in the interests of those who are to follow you, we will, of course, carry out your desires ; but, at the same time, until we get an express mandate from you we shall continue to recommend you to divide the net revenue which you have earned in the half-year, and earned honestly, and distribute it amongst yourselves in the form of dividend."

The present generation of proprietors would, doubtless, be better off if their predecessors had been content with smaller dividend payments and devoted part of the free revenue to the improvement of the property, and the experience of American railroads has been instanced to show the advantages of such a policy. The different circumstances attending the construction and operation of railroads in the United States should, however, be kept in view. The lines there were mostly laid down in a far less solid and substantial manner, and with the increase of business, improvements amounting to practical reconstruction are necessary in order to conduct the traffic. The "betterments" which figure so largely in American railroad accounts form an elastic element which would never be permitted by British railway proprietors, who are accustomed to scan closely the revenue and expenditure. Notorious instances exist in the railroad history of the United States, in which continuous outlay of this character has been accompanied by actual deterioration of position and credit. One of the leading companies, the Baltimore and Ohio,

carried on its books items of revenue expenditure to the extent of forty-seven million dollars, which did not prevent bankruptcy and reorganisation, with the usual disastrous results to the shareholders. "Reserve funds" of this character are never available when required. Capital outlay is at least subject to discussion in Parliament and before the body of shareholders. Revenue expenditure is less open to check, and its use is obviously liable to speculative action.

Reference to the statistics compiled by the Board of Trade would seem to show that in late years the profit-earning capacity of British railways has passed its zenith, and that declining dividends would have to be faced by the shareholders, owing to the cumulative effects of growth of capital and of expenditure. The published figures, however, require considerable modification in view of the fact that the capital, on which the proportion of net revenue is computed, has been swollen of late years by nominal additions which imply no additional liability by way of interest and dividend payments. The debenture and preference charges of most of the leading companies, with varying and comparatively high rates of interest, have been consolidated into low-interest-bearing stocks, increased capital being given to the holders to represent the reduction of yield. The change has been advantageous, both as increasing the facilities for further borrowing and as providing the holders with more marketable securities.

Another form of nominal increase has less to recommend it. The "splitting" or "duplication" of stock

indeed may form a possible embarrassment to the companies who have adopted it. The first use of the principle was made in the early history of the Great Northern Railway, when the shares being temporarily difficult of sale, permission was given by Parliament to split them into deferred and preferred portions. It was found in practice that the divided stocks had jointly a higher value, due to the increase of security in the case of the preferred and to larger speculative possibilities in the moiety possessing the reversion. There can be no valid objection to the apportionment of revenue thus provided for, but a step further has been sanctioned by Parliament in the duplication of ordinary capital by several of the companies through the exchange of every £100 of original stock into £100 preferred and £100 deferred. The principle or want of principle here involved is to be deprecated. The companies concerned, of course, only distribute the free revenue as before, and undertake no fresh liability through this increase of capital; but the subsequent balance-sheets can hardly show the true position of the undertaking with so much "water" added. The policy may be described as "fair weather" finance, and one reason urged for its adoption was that the nominal reduction of dividends would render the companies concerned less liable to attack on the ground of excessive profits secured from the public. In case, however, of declining profits, the position of the companies must be considerably weakened by the existence of a mass of capital representing no tangible assets.

As already stated, the germ of the finance in question originated with the Great Northern Railway. In the discredit following the railway mania of 1845, when the Company's finances were seriously embarrassed by the difficulty of enforcing the payment of calls, it was suggested that the option might be given to shareholders to split their £25 shares into two of £12 10s. each, one of which should be guaranteed by the other a permanent 6 per cent. dividend upon the amount paid up, with the option of paying up the whole amount at once, while the other, or "deferred" half, should receive the balance of interest or dividend after the payment of the 6 per cent., and should be relieved of the pressure of "calls." The main object was to enable shareholders who had a difficulty in meeting their "calls" to relieve themselves by disposing of half their shares to parties who would be willing, under the attraction of the 6 per cent. guarantee, to pay up upon them at once and in full; but as the Chairman, Mr. Denison, stated, it had the further advantage of creating a stock paying 6 per cent. —if the whole capital earned enough—which would be "exceedingly valuable to quiet people in the country and in town," while, on the other hand, it held out an inducement to more speculative persons to come into the concern and take the chance of all dividends above 6 per cent. The plan was afterwards embodied in the Company's Act of 1848, with the addition that the "A" shares, as the deferred halves were called, were credited with the amount already paid up, so that the inducement of the 6 per cent. guarantee might operate to bring

in the whole of the £12 10s. represented by the "B" shares; but this did not prevent the latter from being greatly sought after, and a considerable number of shareholders availed themselves of the option of "splitting." The same policy was adopted by the London and Brighton Company in the difficult times following the financial panic of 1866, and option was given to the shareholders by the Company's Act of 1868 to "split" their holdings into 6 per cent. preferred and deferred halves.

A plan previously only adopted by companies in more or less embarrassed circumstances received general sanction under the Regulation of Railways Act, 1868, a clause of which, copied from the Brighton Company's Bill of the same year, permitted the division of ordinary stocks into preferred and deferred moieties. The 6 per cent. standard for the preferred, first fixed by the Great Northern Company and adopted by the Brighton Railway, certainly represented an excessive value for money, and only the South Eastern and the Manchester, Sheffield, and Lincolnshire—now the Great Central—Companies availed themselves of the provisions of the Act. When the Great Central reorganised its capital on the occasion of the extension to London, the "splitting" of the stock was made compulsory on the shareholders.

The North British Railway rearrangement of capital under the Act of 1888 involved the first step in the actual "watering" of stock. In providing for the absorption of the Edinburgh and Glasgow capital of £2,422,000, new ordinary North British stock was created

to the amount of £7,603,000, to cover both that issue and the existing £5,180,000 North British stock, the holders of which latter stock also received an equal amount of £3 per cent. ordinary preference, the duplication being sanctioned by Parliament.

The example was not thrown away. In the following year the Taff Vale Railway, a Welsh mineral line, which had earned and distributed dividends as high as 18 per cent., carried the principle still further. Actuated doubtless by fears of attracting the cupidity of the public, or of the legislature by such a display of profits, or for some more readily avowable cause, permission was obtained by the Act of 1889 to issue £250 of new stock for each original £100; but it was stipulated by Parliament that any surplus after 6 per cent. dividends had been declared on the increased stock should be devoted to the reduction of tolls, or in such other way used to the public advantage as might be directed.

In the session of 1890 the Great Northern Company, in proposals for rearranging its capital stocks, applied for powers for a nominal increase of their amount, while the Caledonian, London and South Western, and Isle of Wight Railways sought for permission to duplicate their ordinary stocks while dividing them into preferred and deferred portions. A Select Committee of the House was appointed to consider the questions involved, and after taking evidence, which included that of representatives of the Board of Trade, of the Bank of England, and of the Stock Exchange, the four Acts in question were passed. The object of the Great Northern Bill

was to extend over the whole of the ordinary stock the "splitting" process adopted in the troublous times of 1847. It was proposed to convert each £100 of ordinary undivided stock into £75 of 4 per cent. preferred and £50 of deferred. The "splitting" was made compulsory, but the holders of the stocks originally converted into "A's" and "B's" could not be compelled into the scheme for the reason that the "B's" possessed a right as against the "A's" of a cumulative dividend in case the profits of any year did not yield their 6 per cent., and this right conversion would destroy. The only thing to be done with regard to the "A's" and "B's" was to provide that they should be converted whenever equal amounts of each were voluntarily brought in for the purpose. The result of the supposed simplification of accounts was thus to increase the number of stocks and to eliminate the only one, the ordinary stock, which was quite simple, and in the terms of which the dividends are declared.

The London and South Western Act of 1890 provided, as above stated, for the optional conversion of £100 of ordinary stock into £100 each of 4 per cent. preferred and deferred stocks. The provisions of the Isle of Wight Railway Bill were similar, but compulsory powers were taken. The Caledonian Company, in securing the optional duplication of their stock, gave 3 per cent. to the preferred portion.

At the first glance it appears somewhat difficult to understand why companies in a sound financial position, and presided over by men of good business experience, should have brought forward proposals which bear in

themselves the elements of unsoundness, and why these proposals should have received the sanction of Parliament. The evidence given before the Select Committee, and the report of that body, go far to explain the mystery. Turning to the evidence of Mr., now Sir Charles Scotter, then General Manager of the London and South Western Railway, with reference to that Company's Duplication Bill, it will be found that he stated that "the origin of the Bill really commenced with certain large shareholders of the London and South Western Company, who brought the subject under the notice of the directors. The directors considered the question at various meetings, and it was pointed out to the directors that unless some steps were taken by the Company to promote a Bill to duplicate or divide their ordinary stock, it would be done by outsiders for the Company; the directors preferred to do it themselves. That is the short history of this Bill." Mr. Archibald Scott, formerly General Manager of the same Company, also gave evidence, and referred in detail to the operations of "outsiders," such as the Railway Investment Trust, and the Stock Conversion Trust, in converting or splitting stocks. The latter Company, he showed, had exchanged £1,000,000 London and North Western Railway stock into £2,500,000 of its own stocks, and had also manipulated stocks of the North Eastern, and Caledonian Companies. Referring to these operations, he said:—

"I do not think the stock is bought all at once as it were, but bought gradually, for the reason that the capital of the Trust is so small. I do not see how they could do it if it is not done according as the Conversion Company's own stock is taken up."

Referring to the important question of the voting power conferred upon or obtained by outside manipulators of railway stocks, Mr. Scott said :—

“I believe the operations of the Conversion Trust is not without danger to the railway companies if it were carried to a greater extent, which possibly it might in the future be unless the railway companies themselves take means to afford the proper conversion under direct parliamentary provisions and under the direct control of the railway companies themselves. If profit is legitimately to be made out of this transaction, it ought to go to the railway proprietors themselves. The power which it gives to a syndicate or a small body of men to control up to a certain extent the railway companies is dangerous for the reason that at railway meetings generally comparatively few proprietors attend ; and even if the board send out proxies, very few proprietors take the trouble to return the proxies, and by their being in combination it would not be difficult to cause embarrassment and injury to the company.”

On the same point Sir James King, Deputy Chairman of the Caledonian Railway, was equally emphatic. He said that in the course of the previous summer he became aware that the Stock Conversion and Investment Company had bought up £600,000 of the Caledonian stock for the purpose of dividing, as it had already done with London and North Western and North Eastern stock. He said :—

“The Caledonian Board were not anxious to have their stock divided ; they thought there was an inconvenience, and that there might be a danger arising to the company if these large blocks of stock were made into successive trusts, and that it was better that the company should ask for powers to

enable their own shareholders without going outside of the company to divide their stock if so inclined, leaving it perfectly optional; and that is the reason of our being here with our Bill to-day. The conversion could be done more economically through the Caledonian itself, and without any annual charge for the management of the divided stock, as in the case of the Stock Conversion Company. Moreover, the holding of large stocks in the hands of the Trust or any outside corporation might have a possible material effect upon the voting power, especially in a Wharnccliffe meeting. There are other large railway companies subject to the same dangers and inconveniences, who have not yet taken the step of dividing their stocks, but some of them, such as the London and North Western, the Great Western, and the Midland, are so large that even the operations of several trusts would not affect them to the same extent as we would be liable to be affected."

It is curious to note that a dozen years later the largest of the companies, the London and North Western, was subjected to an attack based on the voting power of this very Conversion Trust, whose promoter was the moving spirit of the Shareholders' Committee, defeated by a comparatively narrow proxy voting margin at the meeting in February, 1903. It is obvious from the foregoing evidence that fears of some such action arising from an extension of outside conversions was the chief motive of directors in bringing forward the 1890 Bills. The Conversion Trust and its congeners thus bear a serious responsibility for initiating and forcing on a class of finance which is deprecated by most railway boards, and has had an unfavourable effect upon British railway credit.

The report of the Select Committee on the measures in question states :—

“ Although the proposals in the Bills referred to your Committee differ in points of detail, they all have for their principal object the division of ordinary stock into two portions, one of which shall have assigned to it a fixed rate of dividend, while the other shall be entitled to such an amount of income as, after the payment of this fixed dividend on the first portion, may remain available for distribution out of the earnings of the company. The railway companies are impelled to apply for power to make this alteration in their stock by the belief that the stock in its new form will be more convenient and attractive to investors, and therefore advantageous to the proprietors.

“ It appears to your Committee that two distinct questions present themselves for decision, viz. (1) Whether the proposed change in the form of railway ordinary stock ought to receive the sanction of Parliament ; (2) How far it is necessary, or expedient, that Parliament should interfere with the method by which the change is carried out ; and if Parliament does so interfere, whether the terms and conditions under which stock may be converted should be prescribed in a General Enabling Bill.

“ With regard to the first question, your Committee see nothing unreasonable, or objectionable from a public point of view, in the conversion of ordinary stock into a preferred and a deferred class, and, therefore, recommend that the necessary power for that purpose should not be refused when a railway company desires it.

“ In order to come to a satisfactory conclusion on the second question, it is necessary to bear in mind what has hitherto been the attitude of Parliament with regard to such matters.

“Your Committee find the principle applicable to such questions very clearly laid down by the Royal Commission on Railways, presided over by the Duke of Devonshire, in its Report dated 7th May, 1867. The Commissions say (paragraph 90): ‘In fact, these parliamentary restrictions tend to give the investing public the idea that they possess some peculiar advantage, and to lull them into a false security as to the value of the debentures and of the share capital. But now that Parliament has adopted the policy of placing any lawful enterprise, conducted by means of a joint-stock capital, within the reach of all associations of persons more than six in number, and has conferred upon them the privilege of limited liability, it would appear to be a more judicious course that Parliament should relieve itself from all interference with the incorporation and the financial affairs of railway companies, leaving such matters to be dealt with under the Joint Stock Companies Act, and should limit its own action to regulating the construction of the line, and the relations between the public and joint-stock companies so incorporated; requiring such guarantees as may be necessary for the purpose of securing the due performance of the conditions upon the faith of which the parliamentary powers of the Company have been granted.’

“The principle thus stated has been adopted by the Board of Trade, which is the public department concerned in the matter; it has been asserted and appealed to by successive ministers, and accepted by eminent parliamentary authorities. Its soundness, also, has stood the test of time. The only important departure from it occurred in the Regulation of Railways Act, 1868, into which a clause was introduced (Section 13) permitting the division of stocks, and laying down with great elaboration the precise conditions which should govern that operation. The result has, however, been that, except in a few cases which occurred shortly after the

passing of the Act, no advantage has been taken of that section.

"Your Committee recommend, therefore, that Parliament should continue to act upon the principle of non-intervention in the financial affairs of railway companies, believing that while the public are naturally concerned in the solidity and stability of corporations, to which Parliament has given large exclusive powers, these objects are, in most cases, best secured by trusting to the self-interest of the shareholders.

"There may be, however, in proposals such as those now under consideration, points directly affecting the public interest, and your Committee have carefully scrutinised these Bills with this possibility in view. In order to avoid any confusion as to the actual amount of the paid-up capital of a company, your Committee think it right to insist (1) that the dividend shall in all cases continue to be declared on the original stock, and (2) that the original stock or paid-up capital shall be recorded and shown in the accounts, as though no alteration had been made in the form of the stock.

"It also appears to your Committee that all railway stocks converted into preferred and deferred stocks should bear a uniform nomenclature.

"Subject to these provisions, your Committee, on the grounds above stated, submit that there is no reason why these Bills should not, with some amendments they have made in them, be passed into law."

In further adoption of the principle thus sanctioned by Parliament, the Barry Railway, in 1894, and the Rhymney Railway, in 1895, obtained powers to duplicate their ordinary stocks, the preferred stocks receiving 4 per cent. interest. The Cardiff Railway Company, which followed three years later, took power for "split-

ting" the stock, also giving 4 per cent. to the preferred portion; and the Central London Railway, while in course of construction, secured similar powers. Finally, in 1897, the Midland and the Glasgow and South Western lines, which have been worked in close harmony, and concerning which proposals for fusion had been discussed, both obtained the permission of Parliament for the compulsory duplication of their stocks, the low rate of $2\frac{1}{2}$ per cent. being fixed for the preferred portion. The Great North of Scotland in the same year duplicated its stocks, giving 3 per cent. to the preferred. In the case of the Midland Company, special provision is made by the Act that notwithstanding the conversion, the Company shall continue to ascertain and declare their dividends on the amount of ordinary stock which would have been entitled to dividend if no such conversion had taken place, the amount of such dividend being held as the actual rate to all purposes, including the Trustee Act of 1893. This measure, it should be stated, enacts that all the debenture and preference issues of a company shall rank as investment stocks in which trustees may place their trust funds, provided the railway in question has during each of the ten years immediately preceding investment paid annual dividends of not less than 3 per cent. on their ordinary stocks. The elimination of ordinary stock has therefore to be provided for.

The directors of several of the leading lines have been consistently opposed to any "splitting" or "duplication" of stocks, and their objections have doubtless

been confirmed by the decisions of the law courts with respect to liabilities incurred by the nominal increase of capital. Under its Act of 1897 the Midland Railway was empowered to rearrange and consolidate its various stocks and to duplicate the ordinary capital, as already stated, the result of the plan being an increase in the total capital of £59,230,597. The Stamp Act of 1891 provides that in case of any increase of the amount of nominal share capital an *ad valorem* duty of 2s. for every £100 shall be charged, with a cumulative penalty for neglect to render due statement of such increase. Claim was made by the Inland Revenue Commissioners for the duty and penalties, and ultimately by the decision of the House of Lords in 1902 the Company was adjudged to pay a total sum of £108,000, together with costs of the proceedings. It may be added that by subsequent enactment the stamp duty in question has been increased from 2s. to 5s. per cent., an additional argument against unnecessary "watering" of capital.

A further addition to the nominal capital of the companies has arisen from the sanction given from time to time by Parliament to embarrassed companies for the issue of capital at a discount. The worst offender in this respect was the London, Chatham, and Dover, the discount on whose stocks runs well over a million sterling. The Great Eastern in its early history placed a considerable amount of its securities below par, and the London and Brighton Company in 1867 was authorised to issue shares at a discount. The Great Central and Metropolitan District Companies have also standing

in their accounts discounts of over half a million each. The Board of Trade Summary Table shows that of a total paid-up share and loan capital in 1901 of £1,195,564,478 of the railways of the United Kingdom, nominal additions have been made of £189,517,765, while there have been reductions of £2,060,936, leaving a net addition of £187,456,829, or over 15 per cent. On the other hand, large amounts have been secured by the companies practically free of cost in the way of premiums on the issue of stock.

As already mentioned, the adoption of "watering" by duplicating stocks is largely responsible for the unfavourable appearance in recent years of the aggregate statistics of the railways of the United Kingdom in the matter of return upon the capital invested. In the twenty years between 1870 and 1890 the yield in question, according to the Board of Trade statistics, was fairly uniform, ranging from 4 to as much as $4\frac{3}{4}$ per cent. on the total of paid-up stocks of all classes. The last decade of the last century, which was coincident with most of the additions of nominal capital, saw a decline in this yield to about $3\frac{1}{4}$ per cent. by 1901. The decrease, however, was accompanied and accentuated by a considerable advance in the cost of materials generally, and of coal in particular, during the time of the South African war, resulting in a marked falling off in dividends. A similar though not quite so pronounced a decline in the rate of distribution took place in 1893, the year of the coal strike. Taking the figures for the last twenty-five years, the official report of the Board of

Trade gives the proportion of net receipts to paid-up capital as under:

Year.	%	Year.	%	Year.	%	Year.	%	Year.	%
1878...4'25		1883...4'21		1888...4'03		1893...3'60		1898...3'55	
1879...4'15		1884...4'16		1889...4'21		1894...3'77		1899...3'61	
1880...4'38		1885...4'02		1890...4'10		1895...3'80		1900...3'41	
1881...4'29		1886...3'99		1891...4'00		1896...3'88		1901...3'27	
1882...4'32		1887...4'00		1892...3'85		1897...3'73		1902...3'42	

These figures by themselves would appear to tell a tale of shrinking revenues and dwindling dividends; but it will be noted that the decline in the ratio practically dates from the commencement of the inflations of capital already detailed. The diminished dividends being spread over the nominal increase of stock, the original holders are practically none the worse off. Their position, moreover, has been steadily improving by the fact that, through enhanced credit and the lower value for money, temporary loans have been replaced by irredeemable debenture stock bearing a lower rate of interest. Guaranteed and preference issues are also now placed on more favourable terms than heretofore, so that the margin of free revenue after meeting prior charges tends to increase. That the actual dividends paid by the leading companies have not on the whole decreased may be seen from the following table, which gives the rates paid on the ordinary stocks, for the past quarter of a century, undiluted by nominal increase of capital—except in the case of the North British. The advent of the Great Central as a through line accounts for a certain abstraction of traffic from its immediate neighbours.

AS INVESTMENTS

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Year.	Great Eastern.	Great Northern.	Great Western.	Lancs. and Yorks.	London and N. Western.	London and S. Western.	London and Brighton.	Midland.	North Eastern.	South Eastern.	Caledonian.	Glasgow and Western.	N. British.	Gt. North. (Ireland).	Gt. South. and West.	Midland Gt. West.	Year.
1878	1	5	3	4	6	5	5	5	6	5	4	3	11	5	4	4	1878
1879	1	5	4	5	7	5	5	5	5	5	4	3	11	5	4	4	1879
1880	1	5	5	5	7	5	5	5	5	5	4	3	11	5	4	4	1880
1881	1	5	5	5	7	5	5	5	5	5	4	3	11	5	4	4	1881
1882	2	5	6	4	7	5	5	5	5	5	4	3	11	5	4	4	1882
1883	2	5	6	4	7	5	5	5	5	5	4	3	11	5	4	4	1883
1884	2	5	6	4	7	5	5	5	5	5	4	3	11	5	4	4	1884
1885	2	5	6	4	7	5	5	5	5	5	4	3	11	5	4	4	1885
1886	2	5	6	4	7	5	5	5	5	5	4	3	11	5	4	4	1886
1887	2	5	6	4	7	5	5	5	5	5	4	3	11	5	4	4	1887
1888	2	5	6	4	7	5	5	5	5	5	4	3	11	5	4	4	1888
1889	2	5	6	4	7	5	5	5	5	5	4	3	11	5	4	4	1889
1890	2	5	6	4	7	5	5	5	5	5	4	3	11	5	4	4	1890
1891	2	5	6	4	7	5	5	5	5	5	4	3	11	5	4	4	1891
1892	2	5	6	4	7	5	5	5	5	5	4	3	11	5	4	4	1892
1893	2	5	6	4	7	5	5	5	5	5	4	3	11	5	4	4	1893
1894	2	5	6	4	7	5	5	5	5	5	4	3	11	5	4	4	1894
1895	2	5	6	4	7	5	5	5	5	5	4	3	11	5	4	4	1895
1896	2	5	6	4	7	5	5	5	5	5	4	3	11	5	4	4	1896
1897	2	5	6	4	7	5	5	5	5	5	4	3	11	5	4	4	1897
1898	2	5	6	4	7	5	5	5	5	5	4	3	11	5	4	4	1898
1899	2	5	6	4	7	5	5	5	5	5	4	3	11	5	4	4	1899
1900	2	5	6	4	7	5	5	5	5	5	4	3	11	5	4	4	1900
1901	2	5	6	4	7	5	5	5	5	5	4	3	11	5	4	4	1901
1902	2	5	6	4	7	5	5	5	5	5	4	3	11	5	4	4	1902
Average 25 years	2 1/2	4 1/2	5 1/2	4 1/2	6 1/2	5 1/2	5 1/2	5 1/2	6 1/2	5 1/2	4 1/2	4 1/2	12	5 1/2	4 1/2	3 1/2	Average 25 years

* Rearrangement of capital.

† Absorption Waterford and Limerick.

From year to year the business and receipts of the railways of the country show a large and steady expansion, which in itself would fully justify the capital increase already referred to, even with the nominal additions. While in the twenty-five years under consideration the capital has grown from £698,545,000 to £1,216,804,000, the gross receipts have risen from £62,863,000 to £109,534,000, in each case about 74 per cent. increase. The relative proportions of passenger and goods business are fairly well maintained, though the former shows somewhat larger development; but year in and year out, in good or bad times, the railways have to deal with increasing traffic and earn larger revenues for the services rendered to the public.

In the matter of expenditure there would, however, appear to be some cause, if not for uneasiness, at least for careful consideration by railway managers and proprietors. The cost of working in late years has been expanding at a greater rate than the receipts. Whereas twenty-five years ago the proportionate cost was 53 per cent., and stood at or about that level for the preceding and succeeding decades, the rate has now advanced to 63 per cent. in 1901, with a slight relapse to 62 per cent. in 1902. Allowing for the result of the extra cost of coal and materials, as one effect of the Transvaal War, the growth of expenditure during the last dozen years has been continuous. In considering the cause of such increase, it must not be forgotten that during that period valuable additions have been made to the comfort and convenience of the

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travelling and trading public. An examination of the time-tables would show greatly improved and accelerated services of trains between London and all principal points in the Midlands and North of England—*e.g.* Birmingham, Manchester, Liverpool, and other towns—and Scotland, while Ireland has not been overlooked, there having been a marked acceleration of the Irish train services. Ireland has indeed received a large amount of attention, and is about to become of great importance to English railway companies. There have also been marked improvements in the services between provincial towns and centres; and it must not be forgotten that by the opening of the Great Central Company's route to London another main line of north-and-south communication has been given to England, and districts formerly practically isolated have been brought into touch with the railway systems of the country, and require development.

Then, turning to the comforts of travelling, the companies have in the past dozen years introduced cars for all classes between London and the leading provincial centres, and Scotland, for breakfast, luncheon, tea, and dinner, and have provided corridor trains and lavatory carriages on a scale not dreamt of in previous years. In this respect railway travelling in the United Kingdom has been revolutionised in the past ten years. Single-berth sleeping compartments in sleeping saloons have also been provided on many routes, and tea and breakfast baskets have now become so common a feature that it is difficult to realise how railway travelling went on

without them. In Ireland also dining and luncheon cars have been introduced.

The period in question has seen greatly advanced arrangements for collecting, forwarding, and delivery of luggage in advance of passengers, with reductions in rates for the conveyance of small parcels by passenger trains, and the issue of stamps for parcels traffic. There has also been an increase in the quantity of free luggage allowed to passengers of all classes. Whilst all these additional facilities have been granted to the public, there has at the same time been a marked tendency to give passengers more for their money in regard to the privileges carried by the tickets. Thus, season tickets have been issued to all instead of only to first and second class, and monthly tickets sold. The issue of week-end tickets has been extended to the principal seaside and pleasure resorts; the issue of tourist tickets during the winter started; and the extension of half-day excursions on occasions of early closing or tradesmen's half-holidays in various towns established. Various forms of circular "1,000 miles" and other tickets have also been issued, whilst the facilities for cyclists have been widely extended. The conveyance of the enormous number of cycles offered at holiday times has introduced a new and most difficult problem of railway working. Then there have been reductions in second-class fares; ordinary return tickets have in many cases been made available for two months; express fares by Irish mail trains have been abolished, and third-class bookings adopted by those trains; and improved resi-

dential services for provincial towns established. Very liberal arrangements have also been made for running special trains in connection with the transatlantic steamship routes, and a riverside station has been opened at Liverpool. At Southampton the developments in connection with the American liners are too well known to require detailed mention.

These improvements, among others, may be given as accounting for the growth of expenditure, but it must be confessed that the chief causes have been such as are quite beyond the control of directors or managers. The reduction of the hours of labour coincidently with the growth of the wages bills of the various companies may be matter of congratulation to the community at large, but they are especially onerous to railway shareholders. The increase in the item of rates and taxes is another serious matter on which railway chairmen are wont to expatiate at half-yearly meetings, and the complaints made are certainly well grounded. As being the chief ratepayer in many parishes throughout the country, there is a constant tendency to increase the burdens, of which so large a proportion can be shifted from the shoulders of the individual ratepayer. Moreover, the methods of assessment are unjust.

In the King's speech, at the opening of the 1903 Session, it was stated that the Government intended to introduce a measure "for improving the law of valuation and assessment," but the measure was not proceeded with. How deeply railways are concerned in this question can be seen from the fact that for 1902

the total contributed to rates and taxes by eighteen of the leading companies was no less than £3,516,000, an increase of £213,000 on the 1901 total, and of no less than £1,648,000 on the 1891 figures. The returns of the companies are as under:—

Rates and Taxes.	Year 1902.	Year 1901.	Year 1900.	Year 1891.
Great Central. .	£109,000	£107,000	£103,000	£52,000
„ Eastern .	288,000	271,000	248,000	137,000
„ Northern .	205,000	200,000	189,000	116,000
„ Western .	492,000	444,000	413,000	221,000
Hull and Barnsley .	12,000	12,000	12,000	4,000
Lancs. and Yorks .	207,000	197,000	194,000	126,000
London and N. W.	491,000	456,000	426,000	278,000
London and S. W.	228,000	199,000	180,000	103,000
London, Brighton .	183,000	169,000	156,000	101,000
London, Tilbury .	23,000	20,000	18,000	8,000
Metropolitan .	52,000	55,000	54,000	47,000
Metropolitan Dis. .	33,000	33,000	34,000	26,000
Midland .	389,000	361,000	350,000	200,000
North Eastern .	383,000	374,000	343,000	190,000
North London .	49,000	46,000	43,000	34,000
North Stafford .	29,000	28,000	27,000	14,000
S. E. and Chatham.	288,000	277,000	276,000	180,000
Taff Vale . .	55,000	55,000	49,000	31,000
Total	£3,516,000	£3,303,000	£3,115,000	£1,868,000

In the case of the Lancashire and Yorkshire there are some towns on the Company's system where the rates have increased as much as 3*s.* 2*d.* in the £, or equal to 79 per cent., during the last ten years. Over the whole system the rates in ten years have risen from £132,783 to £206,901, an increase of £74,118, or 56 per cent., and equal to a dividend of nearly $\frac{1}{2}$ per cent. per annum on the present ordinary stock. On the Brighton railway, comparing 1902 with 1892, it is found that rates

and taxes have increased by a little over 67 per cent., whilst gross revenue receipts have increased by only 29 per cent. In 1892 rates and taxes were 4.3 per cent. of the gross receipts, and in 1902 they were 5.5 per cent. of those receipts; and in the latter year they equalled no less than 13.3 per cent. of the Company's net income. The Great Eastern Company's assessment in the parish of Walthamstow in 1891 was £6,500; in 1901 it was £12,600, or an increase of 94 per cent. The rates and taxes this Company paid in Walthamstow in 1891 were £1,540; in 1901 they were £3,746, or an increase of 143 per cent. In 1891 its assessment in West Ham was £33,832, and in 1901 it was £96,882. The Company paid in rates in West Ham in 1891 £7,606, and in 1901, £35,679, or an increase of 369 per cent. These companies' experience in the past ten years may be taken as typical of the records of the other railway systems.

CHAPTER V

THE FUTURE OF RAILWAYS

SEVERAL important questions have arisen in late years in connection with railway interests and prospects. Most of these are concerned with the new and hitherto competing forms of locomotion, which have recently attained such sudden and rapid development. The progress made by electrical science as applied to traction, and the improvement in automobile vehicles, would seem to open a new era in travel and transport. It would be rash to forecast the future while such great changes are in progress, but the locomotive and the horse seem destined to be largely superseded, especially as regards urban communications. The manifest convenience and, indeed, necessity of electrical street tramways would render futile any organised opposition to their further and general adoption, and it remains for the railway to welcome as an ally a form of enterprise which cannot be effectively checked or defeated as a rival.

Rightly regarded, there should be little difficulty in such a policy. All experience proves that traffic grows with the increase of facilities offered, and additional

freedom of movement in the streets implies bringing more passengers and larger volumes of goods to the railway stations for further transport. Whatever increased use may be made of public highways through mechanical traction, these can never compete efficiently for long-distance traffic with the railway line unimpeded by pedestrian and vehicular traffic. Higher speed and greater safety can always be offered by the existing companies, and where the advantages of electrical power are, or can be, conclusively proved there are nothing but considerations of cost to prevent its adoption or supplementary use on the various systems. Local electric or motor services have already been inaugurated by some of the companies. In the former case the lines are mostly urban or practically suburban services intended to carry passengers comparatively short distances by frequent trains, there being an existing heavy traffic threatened by tramway or tube competition. On the other hand, where branch-line business has proved inadequate to bear the expense of running heavy rolling stock and engines, steam-propelled cars have been introduced and petrol motors are to be shortly tried.

The companies, indeed, show a praiseworthy disposition to adapt their working to the changed and changing conditions of traffic. Permissive powers have already been obtained by some for the use of electricity for working in whole or in part, and Parliament last session passed a Bill which has for its express object "to facilitate the introduction and use of electrical power on railways." The effect of this measure will be to

render it unnecessary for railway companies to introduce private Bills for enabling them to work their lines electrically, by giving to the Board of Trade authority to make orders having the force of law, which will empower the companies so to work their lines. This is simply an extension of the powers given by various Acts to the Board, by virtue of which its provisional orders confer statutory powers of various kinds upon companies and local authorities, mostly used hitherto in the case of electric supply and tramway undertakings.

An order made by the Board of Trade thus has the effect of an Act of Parliament, and would not require the confirmation of the House, unless it contains power for the compulsory purchase of land. Besides giving a railway company power to use electricity, erect generating stations, enter into agreements for the supply of electrical power, and to raise new capital for any of these purposes, the orders made by the Board of Trade may sanction the modification of working agreements, so far as such modification is agreed to between the parties, and is consequential upon the use of electrical powers. It may well happen that a company applying for an "electrification order" desires to have agreements modified, whilst the other parties refuse their consent. In such a case the Bill provides that an order may modify an agreement, but that an appeal may be made by any company affected to the Railway Commission, and so far as appealed against the order will not come into force unless confirmed by that body. This should overcome mere obstructiveness without sacrificing actual interests.

Appeals may also be made to the Railway Commission if an order contains provisions for the revision of passenger fares or for affording additional public facilities by means of through booking on to railways or tramways owned or worked by other companies. One of the purposes for which orders may be made is described as "securing the safety of the public." This means, no doubt, that the Board of Trade may make rules and regulations for imposing safe conditions of use. These regulations will, doubtless, facilitate the use of electrical working on railways when and as it is found that it can be adopted. Of the advantages of such adoption in the case of short-distance heavy passenger traffic little doubt can now be felt, where considerations of cost do not intervene, but with regard to main line and goods and mineral traffic there are obvious difficulties to be overcome.

As a mere question of application of power, loss is sustained by the conversion of steam power into electricity as against its direct use for traction, though some offset is obtained by the abolition of the constant item of haulage of coal-supply in tenders and the waste of fuel and steam in idle engines. The marshalling of goods waggons, and the running of long-distance non-stopping trains will doubtless still demand the use of the steam locomotive. The possibility of high-speed electrical passenger services for comparatively long distances, such as those indicated by experiments in Germany, and promised by the advocates of the Behr mono-rail system, the adoption of which is already sanctioned on a line

between Manchester and Liverpool, must not be overlooked. It may be presumed that railway managers and boards are carefully watching developments in electric traction, of which, if suitable, they should be in a good position to make use by laying additional tracks by the side of the present railway lines. The construction of new routes throughout the country would imply a waste of capital and an injury from competition which is not likely to be sanctioned by Parliament, if the leading companies show a proper disposition to adapt their roads and equipments to new requirements.

There is one feature of tramway competition with railways which should not be overlooked. It is transparently unjust to grant free use of the public highways—for the support of which the railways as ratepayers are the largest contributors—to rivals in business of the existing lines. The railways have paid in the past handsomely, if not exorbitantly, for every foot of the right-of-way used by them, while their competitors start unhampered by excessive capital charges. On grounds of public convenience and necessity, it is, however, obviously idle to argue against such utilisation of the highways. But it may be fairly contended in the railway interest that use of public property and of the large revenues attending its employment should be for the public benefit. It is abundantly proved that tramway enterprise, in which no great measure of administrative capacity is necessary, is highly profitable, and it is contended that such profits should be in the hands of public bodies, and should be devoted to a

reduction of the rates and taxes, which weigh so heavily on railway enterprise.

Railway companies should have the less compunction in supporting, or, at least, in not opposing the municipalisation of tramways, for the reason that private interests concerned in this form of enterprise are far less scrupulous in the matter of competition. In various districts throughout the country, towns and villages have been gradually linked up by electrical communication until systems have been formed, the construction of which would never have been permitted by Parliament as single projects. The attempted utilisation of the Light Railway Acts for the purpose of establishing routes competing with existing railways has been more than once checked in the committee-rooms, and would not have been countenanced by municipal authorities, who are, or should be, guided by purely local considerations, whatever sins of omission or commission may be laid to their charge by the "Industrial Freedom League," and other kindred organisations. The tendency of municipal management would doubtless be to regulate and restrict profit-earning by reduction of fares, or increase of facilities to passengers, but within proper limits this need not imply unfair competition with railways, which is certainly present in an undiluted form when the field is occupied by private enterprise. Obviously where the municipal tramways make large profits, the railway companies, as the principal ratepayers, secure some return for the short-distance traffic abstracted from their systems.

Before closing this brief glance at the future of railways, mention must be made of the very interesting movement which Lord Iveagh and the Right Honourable W. J. Pirrie have in hand for providing transport facilities in Ireland in districts not served by existing railway companies. The problems to be worked out are by no means easy, no two districts having the same characteristics and conditions, and the first thing to be done is to secure full information as to how these local interests may be best served. Under the scheme it is proposed to establish central depôts for the receipt of all kinds of Irish produce in various parts of the country. These depôts will be situated as near as possible to existing means of transit—to the trunk lines and the light railways. Where no railways of any kind exist the produce will be conveyed by means of an extensive carrier service to the nearest depôts. It is intended to build a number of motor-vans, which will be introduced gradually in the more outlying districts. Ordinary horse-drawn vehicles will also be utilised, to start with, at any rate. At the same time the Earl of Leitrim is organising an autocar service for the north-west of Donegal, with vehicles to carry sixteen passengers and about half a ton of luggage. A road autocar service is also to be started in the north of England by the North Eastern Railway.

Another hopeful sign of the recognition of the important work which can be done in the way of utilising agencies outside those provided by the ordinary railway company is the attention being given to combination by

the agricultural and other interests. An influential committee has been formed at the House of Commons to encourage the application of improved methods of organisation to British industry. This committee intend to place themselves in communication with chambers of commerce and leading members of the business community ; but agriculture does not appear to come within their purview. Having regard to the results achieved through agricultural organisation in Ireland and in Denmark, from which the exports of butter have risen from £767,000 in 1870 to nearly £9,000,000 in 1901, it is not, the Hon. T. A. Brassey has recently declared, too much to say that, if the same liberality and the same attention were shown to the education of agriculturists in the principles of agricultural organisation as are devoted to technical education in cities, the prospects of British agriculture could be revolutionised. In 1891 there was one agricultural co-operative society in Ireland. In 1903 there were over 700 such societies doing a trade of upwards of £2,000,000 a year. The Irish Agricultural Organisation Society spends nearly £11,000 a year on educational and organising work. The British Organisation Society is endeavouring to cover a far larger field with an income of a few hundreds a year. In less than three years fifty-four societies have been established. It is to be hoped that its work will presently receive the support and attention it deserves.

Quite recently another interesting movement that may play an important part in solving the difficult problem of the movement of the working classes of

large towns to and from their work, has been inaugurated, viz. that for providing "Garden Cities." The promoters of this scheme have acquired a large estate at Hitchin about thirty miles from London, and here they hope to attract factories, the employees of which will be housed under such sanitary and social conditions as are impossible in large towns, and within walking distances of their work.

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